



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION IX
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San Francisco, CA 94105

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Return Receipt Requested

JUL 01 2010

David M. Cote, Chairman and CEO
Honeywell International, Inc.
101 Columbia Rd.
Morristown, NJ 07962

Re: Special Notice Letter for the North Hollywood Operable Unit of the San Fernando Valley, Area 1 Superfund Site for upcoming RD/RA Activities

Dear Mr. Cote:

As you know, the United States Environmental Protection Agency ("EPA" or the "Agency") has been conducting response actions at the North Hollywood Operable Unit of the San Fernando Valley, Area 1 Superfund Site, located in Los Angeles, California ("NHOU"). In various letters dated August 26, 1988, July 19, 1993, and March 28, 2006, Honeywell International, Inc. was issued General Notice as a former owner and operator of real property from which contaminants, including but not limited to trichloroethylene ("TCE") and tetrachloroethylene ("PCE") were released into the environment. Subsequently, EPA has documented the release of additional contaminants from the former Honeywell property, including but not limited to chromium and dioxane. In the General Notice letters, EPA notified you of your potential responsibility under Section 107(a) of the Comprehensive Environmental Response, Compensation, and Liability Act ("CERCLA" or "Superfund"), 42 U.S.C. § 9607(a), for the cleanup of the NHOU, including all costs incurred by the EPA in responding to releases at the NHOU. EPA is now contacting you in an attempt to further resolve your responsibility at the NHOU, and hereby requests your participation in upcoming negotiations to implement the remedy selected in the Interim Action Record of Decision, signed by EPA on September 30, 2009 ("2009 ROD").

Background

In September of 1987, EPA signed the first record of decision at the NHOU, which selected groundwater extraction and treatment for fifteen years as an interim remedy in order to contain and remove contaminant mass from the plume of volatile organic compounds ("VOC") in the NHOU ("Existing Remedy"). The Fourth Five-Year Review of the Existing Remedy's performance, which was conducted by EPA in 2008, concluded that the NHOU VOC groundwater plume was migrating vertically and laterally beyond the remedy's zone of hydraulic control. In addition, since the Existing Remedy began operating in December 1989, several new

contaminants, including chromium and 1,4-dioxane, have been detected in the NHOU at levels requiring remediation.

The 2009 ROD selects a second interim remedy for the NHOU with the following objectives: (1) prevent exposure to contaminated groundwater above acceptable risk levels; (2) contain areas of contaminated groundwater that exceed the maximum contamination levels ("MCLs") and state notification levels to the maximum extent practicable; (3) prevent further migration of the plume; and (4) remove contaminant mass from the aquifer ("Second Interim Remedy"). The Second Interim Remedy is not a final remedy because its scope does not include restoration of the aquifer to levels below MCLs, nor a waiver from this requirement. However, additional data obtained during design and implementation of the Second Interim Remedy is expected to provide the basis for EPA's development of a final remedy. For your information, a copy of the 2009 ROD is enclosed with today's letter.

Special Notice and Moratorium on Certain EPA Actions

EPA has determined that use of the special notice procedures set forth in Section 122(e) of CERCLA, 42 U.S.C. § 9622(e), may facilitate a settlement between you, other potentially responsible parties ("PRPs"), and EPA for implementation of the Second Interim Remedy. Under Section 122(e), this letter triggers a sixty-day moratorium on certain EPA response activities at the NHOU. During this 60-day moratorium, EPA will not begin implementation of the Second Interim Remedy. However, EPA reserves the right to take action at the NHOU at any time should a significant threat to the human health or the environment arise.

During this 60-day period, you and the other PRPs are invited to participate in formal negotiations with EPA in an effort to reach a settlement to conduct or finance the response action at the NHOU. The 60-day negotiation period ends on September 3, 2010. The 60-day moratorium will be extended for an additional sixty days if PRPs provide EPA with a "good faith offer" to conduct or finance the response action and reimburse EPA for its costs incurred to date. If EPA determines that your proposal is not a "good faith offer," you will be notified in writing of EPA's decision to end the moratorium. If the moratorium is extended for an additional 60 days, negotiations will conclude on November 2, 2010. If settlement is reached between EPA and the PRPs within the 120-day moratorium period, the settlement will be embodied in a consent decree ("CD") for Remedial Design/Remedial Action ("RD/RA"). When approved by EPA and the U.S. Department of Justice ("DOJ"), the CD will then be lodged in federal court.

If a "good faith offer" is not received within sixty days, or a timely settlement cannot be reached, EPA may take appropriate action at the NHOU, which may include either of the following options: (1) EPA may fund the remedial action and pursue a cost recovery claim under Section 107 of CERCLA against the PRPs; or (2) EPA may issue a Unilateral Administrative Order ("UAO") to you and/or the other PRPs under Section 106(a) of CERCLA, 42 U.S.C. § 9606, requiring you or them to perform the work described in the 2009 ROD. If the recipients of a UAO refuse to comply with the UAO, EPA may pursue civil litigation against the recipients to require compliance.

A proposed CD (based on EPA's model RD/RA consent decree, which can be found at <http://www.epa.gov/compliance/resources/policies/cleanup/superfund/rev-rdra-2009.pdf>) and a proposed Statement of Work are enclosed to assist you in developing a good faith offer. EPA expects that the Los Angeles Department of Water and Power ("LADWP"), the current operator of the Existing Remedy, will be a signatory to the new CD. It is also possible that the State of California ("State") will join the United States as a plaintiff in this action. The draft CD, however, does not address either LADWP's or the State's participation. EPA intends to add provisions specific to LADWP and the State to the CD as their roles become more clearly defined in the negotiation process, e.g., when the decision is made regarding whether LADWP will continue to serve as operator of the NHOU treatment system. The attached draft CD and draft Statement of Work are not binding on EPA and are subject to revision and approval by EPA and the United States Department of Justice.

Requirements for a Good Faith Offer

As indicated above, the sixty-day moratorium triggered by this letter is extended for sixty days if the PRPs submit a good faith offer to EPA to conduct or finance the RD/RA work. A good faith offer is a written proposal from the interested PRPs that demonstrates their qualifications and willingness to conduct or finance the design, implementation, and monitoring of the remedy and contains the following elements:

- * A statement of your willingness to conduct or finance the remedial action that is consistent with the 2009 ROD and the proposed CD and that provides a sufficient basis for further negotiation;
- * A demonstration of your technical capability to undertake the remedial action; including the identification of the firm(s) that may actually conduct the work or a description of the process by which the firm(s) will be selected;
- * A statement of your willingness to reimburse EPA for past costs as well as the costs EPA would incur in overseeing implementation of the remedial action;
- * A response to the proposed CD. If your offer contemplates modifications to the proposed CD, please work from this CD and submit a version showing any modifications to it;
- * A list identifying each party on whose behalf the offer is being made, including name, address, and telephone number of each party;
- * A proposed schedule for six months of bi-weekly calls and monthly meetings between all participating PRPs and EPA beginning sixty days after the date of this letter.
- * A written explanation as to how you intend to proceed with the remedial action; and

- * The name, address, and telephone number of the party who will represent you in negotiations.

Demand for EPA Costs

In accordance with CERCLA, EPA has already undertaken certain actions and incurred costs of at least \$13,015,587 in response to conditions at the NHOU, which includes \$2,708,864 in Basin-wide costs attributable to the NHOU. These response actions include, but are not limited to: preparation of a focused feasibility study for the Second Interim Remedy and preparation of the 2009 ROD. EPA also anticipates expending additional funds for response activities at the NHOU, which may include a remedial action or oversight of a remedial action. In accordance with Section 107(a) of CERCLA, demand is hereby made for payment of EPA's response costs plus any and all interest recoverable pursuant to CERCLA Section 107 or under any other provisions of law.

Some or all of the costs associated with this notice may be covered by current or past insurance policies issued to you. Most insurance policies will require that you timely notify your carrier(s) of a claim against you. To evaluate whether you should notify your insurance carrier(s) of this demand, you may wish to review current and past policies, beginning with the date of your first contact with the NHOU, up to the present. Coverage depends on many factors, such as the language of the particular policy and state law.

In the event that you file for protection in the bankruptcy court, EPA reserves the right to file a proof of claim or application for reimbursement of administrative expenses against the debtor.

Informational Meeting

EPA invites you to attend an Informational Meeting on July 20, 2010, at 10:00 a.m. at the below address. At this meeting, EPA will present information regarding the NHOU and the 2009 ROD, and will be open for questions.

U.S. EPA Southern California Field Office
600 Wilshire, Ste. 1460
Los Angeles, CA 90017

PRP Steering Committee

EPA encourages good faith negotiations between your company and the Agency, as well as coordination among your company and the other parties potentially responsible for contamination at the NHOU. EPA encourages PRPs involved at the NHOU to form a PRP steering committee. EPA believes that a PRP steering committee is the best vehicle for establishing and maintaining coordinated and constructive dialogue both within the PRP group

itself and between PRPs and the Agency. For your information and to facilitate organization, we have enclosed a list identifying all of the PRPs who are receiving special notice letters similar to your own.

EPA recognizes that the allocation of responsibility among PRPs may be difficult, and EPA does not maintain that previous allocations among PRPs are binding on prospective negotiations. If PRPs are unable to reach consensus among themselves, we encourage the use of the services of a neutral third party to help allocate responsibility. Third parties are available to facilitate negotiations (i.e., to mediate). If requested, EPA can provide a list of experienced third-party mediators, or help arrange for a mediator.

Administrative Record

In accordance with Section 113 of CERCLA, 42 U.S.C. § 9613, EPA has established an administrative record ("AR") containing the documents that serve as the basis for EPA's selection of the appropriate response action for the NHOU. The AR is located at:

- City of Los Angeles Central Library, Science & Technical Department: 630 West 5th Street, Los Angeles, CA, 90071
- North Hollywood Regional Branch Library, 5211 Tujunga Avenue, North Hollywood, CA, 91601
- Burbank Public Library, Central Library, 110 North Glen Oaks Blvd., Burbank, CA, 91502
- Glendale Public Library, 222 East Harvard St., Glendale, CA, 91205

and is available to the public for inspection. The AR is also available for inspection at the Superfund Records Center, EPA Region IX, 95 Hawthorne Street, San Francisco, CA 94105. You may wish to review the AR to assist you in responding to this letter, but your review should not delay such response beyond the 60-day period provided by CERCLA.

PRP Response

You are encouraged to contact EPA by September 3, 2010 to indicate your willingness to participate in future negotiations concerning the NHOU. You may respond individually or through a steering committee if such a committee has been formed. If EPA does not receive a timely response, EPA will assume that you do not wish to negotiate a resolution of your liabilities in connection with the NHOU, and that you have declined any involvement in performing the response activities.

Your response to this Special Notice Letter and the demand for costs included herein, including written proposals to perform the remedial action selected for the NHOU, should be sent to:

Kelly Manheimer, Remedial Project Manager (SFD-7-1)
United States Environmental Protection Agency
75 Hawthorne Street
San Francisco, CA 94105
(415) 972-3290

Resources for Small Business

As you may be aware, on January 11, 2002, the Superfund Small Business Liability Relief and Brownfields Revitalization Act (the "Act") became effective. The Act contains several exemptions and defenses to CERCLA liability, which we suggest all parties evaluate. You can obtain a copy of the Act at: <http://www.epa.gov/swerosps/bf/sblbra.htm>. You can review EPA guidances regarding these exemptions at <http://www.epa.gov/compliance/resources/policies/cleanup/superfund>.

EPA has created a number of helpful resources for small businesses. EPA has established the National Compliance Assistance Clearinghouse as well as Compliance Assistance Centers, which offer various forms of resources to small businesses. You may inquire about these resources at www.epa.gov. In addition, the EPA Small Business Ombudsman may be contacted at www.epa.gov/sbo. Finally, EPA developed a fact sheet about the Small Business Regulatory Enforcement Fairness Act ("SBREFA"), which is enclosed with this letter.

If you have any questions regarding the technical aspects of this letter, please contact Kelly Manheimer, Remedial Project Manager, at (415) 972-3290. If you have an attorney handling your legal matters, please direct his or her questions to Michael Massey, Assistant Regional Counsel, at (415) 972-3034.

The factual and legal discussions in this letter are intended solely to provide notice and information, and such discussions are not to be construed as a final EPA position on any matter set forth herein. Due to the seriousness of the environmental and legal problems posed by the conditions at the NHOU, EPA urges that you give immediate attention and prompt response to this letter.

My staff and I look forward to working with you during the coming months.

Sincerely,



Kathleen Salyer, Assistant Director
Superfund Division
California Site Cleanup Branch

Enclosures

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EPA Superfund

Interim Action Record of Decision

North Hollywood Operable Unit

San Fernando Valley (Area 1) Superfund Site

Los Angeles County, California

EPA ID: CAD980894893

09/30/2009



Interim Action Record of Decision
For the
North Hollywood Operable Unit

San Fernando Valley (Area 1) Superfund Site
Los Angeles County, California
EPA ID: CAD980894893

September 30, 2009

United States Environmental Protection Agency
Region IX – San Francisco, California

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Acronyms and Abbreviations

µg/L	micrograms per liter
AOP	advanced oxidation process
ARAR	Applicable or Relevant and Appropriate Requirements
BAC	biologically activated carbon
bgs	below ground surface
BOU	Burbank Operable Unit
CAO	Cleanup and Abatement Order
CCR	California Code of Regulations
CDI	chronic daily intake
CDPH	California Department of Public Health
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CFR	Code of Federal Regulations
COC	contaminant of concern
COPC	chemicals of potential concern
DTSC	State of California Department of Toxic Substances Control
DWR	Department of Water Resources
EPA	U.S. Environmental Protection Agency
FFS	Focused Feasibility Study
FS	Feasibility Study
GOU	Glendale Operable Unit
gpm	gallons per minute
HI	hazard index
HHRA	human health risk assessment
HQ	hazard quotient
ID	identifier
LADWP	Los Angeles Department of Water and Power
lbs	pounds
LPGAC	liquid phase granular activated carbon
MCL	maximum contaminant level
MCLG	maximum contaminant level goal
msl	mean sea level
NAPLs	non-aqueous phase liquids
NDMA	N-Nitrosodimethylamine
NHE	North Hollywood Extraction
NHOU	North Hollywood Operable Unit
NPV	net present value
O&M	operation and maintenance

OU	Operable Unit
PCE	tetrachloroethylene, also known as perchloroethylene
PRP	Potentially Responsible Party
RfD	reference dose
RI	remedial investigation
RME	reasonable maximum exposure
ROD	Record of Decision
RSL	regional screening level
RWQCB	Los Angeles Regional Water Quality Control Board
SCAQMD	South Coast Air Quality Management District
SDWA	Safe Drinking Water Act
SF	slope factor
SFV	San Fernando Valley
State	State of California
TCA	1,1,1-trichloroethane
TCE	trichloroethylene
TCP	1,2,3-trichloropropane
ULARA	Upper Los Angeles River Area
VOC	volatile organic compound
VPAC	vapor-phase granular activated carbon

Part 1
Declaration

Part 1 – Declaration

1.1 Site Name and Location

The North Hollywood Operable Unit (NHOU) of the San Fernando Valley (Area 1) Superfund Site (Site) is located in Los Angeles County, California (CERCLIS ID No. CAD980894893).

1.2 Statement of Basis and Purpose

This Interim Action Record of Decision (ROD) selects a new interim remedy for the North Hollywood/Burbank Well Field area of the San Fernando Valley (Area 1) Superfund Site, and presents the selected interim remedy for the NHOU (Second Interim Remedy).¹ The Second Interim Remedy was chosen in accordance with the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), as amended by the Superfund Amendments and Reauthorization Act, and to the extent practicable, the National Oil and Hazardous Substances Pollution Contingency Plan (NCP). This decision is based on the administrative record for the Site. The State of California (State) concurs with this Second Interim Remedy.

The selection and implementation of a new remedy for the NHOU is necessary because the interim remedy selected in the Record of Decision for a Remedial Action for Area 1 of the San Fernando Valley Superfund Sites, dated September 23, 1987 (Existing NHOU Extraction and Treatment System), is no longer capable of fully containing the groundwater plume, and because new contaminants have been discovered in the aquifer. Selection and implementation of the Second Interim Remedy is intended to address the continued presence of significant dissolved-phase volatile organic compound (VOC) contamination in groundwater in exceedance of the Maximum Contaminant Levels (MCLs) or state notification levels, the presence of chromium and other emerging chemicals in groundwater in exceedance of the MCLs or state notification levels, and the need to achieve more complete capture of the VOC plume. Changing groundwater conditions in the aquifer and the discovery of VOC contamination in new areas have made it impossible for the Existing NHOU Extraction and Treatment System to fully contain the VOC plume. In addition, the Existing NHOU Extraction and Treatment System was not designed to treat chromium or the emerging chemicals that have been detected in the groundwater since its construction. The presence of elevated concentrations of chromium in the aquifer, as well as the lack of chromium treatment in the treatment system, resulted in the extended shutdown, in 2007, of one NHOU remedy (extraction) well, NHE-2, which serves an important plume containment function.

¹ The Selected Interim Remedy addresses groundwater contamination in the same geographic area as the interim remedy selected in the *Record of Decision for a Remedial Action for Area 1 of the San Fernando Valley Superfund Sites*, dated September 23, 1987 ("1987 ROD"). Because the interim remedy selected in the 1987 ROD was intended only to be the first phase in the response to groundwater contamination in the vicinity of the Los Angeles Department of Water and Power's North Hollywood well field, consistent with the NCP, EPA created a new OU, OU4, to manage the second phase of the response, which will be conducted pursuant to the Selected Interim Remedy. Despite the fact that EPA has created a new OU, it continues to refer to the response action in the vicinity of the North Hollywood well field as the "NHOU" in this document and elsewhere.

The scope of the remedy does not include restoration of the aquifer (i.e., removal of all manmade contaminants), in part because additional data are needed in some areas of the aquifer where the extent of contamination must be better defined before the U.S. Environmental Protection Agency (EPA) can determine what additional actions, if any, are needed to address these other areas of groundwater contamination. In the meantime, EPA considers it important to implement this remedy for groundwater as soon as practicable to prevent further migration of the known high-concentration contaminant plumes, as described above, and to collect additional data to evaluate the need for (and scope of) further action.

To ensure that the groundwater cleanup achieved by this remedy is sustained over the long term, EPA will continue to work closely with the State to ensure that contaminant source areas at individual facilities within the NHOU have been addressed.

1.3 Assessment of the Site

EPA has determined that hazardous chemicals have been released into groundwater within the NHOU, and that a substantial threat of release to groundwater still exists. The response action selected in this ROD is necessary to protect the public health or welfare or the environment from actual or threatened releases of hazardous substances into the environment.

1.4 Description of the Second Interim Remedy

The Second Interim Remedy for the NHOU addresses contaminated groundwater by containing and remediating the groundwater using an extraction well network and above-ground water treatment system. The Second Interim Remedy is a containment remedy for groundwater contaminated with VOCs and chromium in the shallow and deep zone in the NHOU and is intended to prevent further migration of existing groundwater contamination.

The eastern region of the San Fernando Valley (SFV) is characterized by a continuous plume of VOC contamination that starts in the Area 1 Site and continues downgradient in a generally southeast direction through the Area 2 and Area 4 Sites. The NHOU comprises the western portion of the SFV Area 1 Superfund Site; to the east of the NHOU is the Burbank OU, where an interim pump-and-treat remedy has been in place and operating since 1996. By improving the capture of the contaminant plume within the NHOU, the Second Interim Remedy will minimize the migration of contaminants from the NHOU to the Burbank OU and to the downgradient SFV Area 2 Superfund Site. In the future, following additional plume characterization, evaluation of the performance of the Second Interim Remedy and an evaluation of the existing Burbank remedy, EPA will select a final remedy for the SFV Area 1 Site.

The Second Interim Remedy includes performance criteria that will require extraction and treatment of contaminated groundwater at certain locations within the plume, expanded treatment for VOCs, and additional treatment for chromium and 1,4-dioxane. The selected remedy also includes institutional controls (in the form of a groundwater management plan) to insure that changes in groundwater pumping from nearby water supply well fields do not have a negative impact on the NHOU remedy performance.

Components of the Second Interim Remedy for the North Hollywood Operable Unit include the following:

- Repair and/or modification (deepening) of existing extraction wells NHE-1 through NHE-8;
- Construction of approximately 3 new extraction wells and associated piping;
- Addition of the new VOC air stripper treatment process, and installation of a liquid phase granular activated carbon (LPGAC) treatment system;
- Wellhead treatment at existing extraction well NHE-2 to remove chromium and 1,4-dioxane;
- Ex situ chromium treatment for the combined inflow from existing extraction well NHE-1 and two of the new groundwater;
- Delivery of treated water to the Los Angeles Department of Water and Power (“LADWP”) drinking water system;
- Institutional controls (ICs) in the form of a groundwater management plan; and,
- Installation of approximately 37 new groundwater monitoring wells.

1.5 Statutory Determinations

The Second Interim Remedy is protective of human health and the environment, complies with federal and state requirements that are applicable or relevant and appropriate to the remedial action, is cost effective, and utilizes permanent solutions and alternative treatment technologies to the maximum extent practicable.

This remedy also satisfies the statutory preference for treatment as a principal element of the remedy (i.e., reduces the toxicity, mobility, or volume of hazardous substances, pollutants, or contaminants through treatment).

Because this remedy will result in hazardous substances, pollutants, or contaminants remaining on-Site (i.e., in groundwater) above levels that allow for unlimited use and unrestricted exposure, a statutory review will be conducted within five years after initiation of remedial action to ensure that the remedy is, or will be, protective of human health and the environment.

1.6 ROD Certification Checklist

The following information is presented in the Decision Summary section (Part 2 of this ROD). Additional information can be found in the administrative record file for the NHOU.

- Contaminants of concern (COCs) and their respective concentrations (see Sections 2.5 and 2.8)
- Baseline risk represented by the COCs (see Section 2.7)
- Cleanup levels established for the COCs and the basis for these levels (see Section 2.8)

- Current and potential future beneficial uses of groundwater used in the baseline risk assessment and ROD (see Sections 2.6 and 2.7)
- Potential groundwater use that will be available at the Site as a result of the selected remedy (see Section 2.12)
- Estimated capital, operation and maintenance (O&M), and total present worth costs; discount rate; and the number of years over which the remedy cost estimates are projected (see Section 2.12)
- Key factors that led to selecting the remedy (i.e., how the selected remedy provides the best balance of tradeoffs with respect to the balancing and modifying criteria) (see Section 2.12)

1.7 Authorizing Signature

This ROD documents the Second Interim Remedy for contaminated groundwater at the North Hollywood Operable Unit of the San Fernando Valley (Area 1) Superfund Site. This remedy was selected with the concurrence of State of California Department of Toxic Substances Control. The Assistant Director of the Superfund Division (EPA, Region 9) has been delegated the authority to approve and sign this ROD.

Kathleen Salyer
Assistant Director, Superfund Division
California Site Cleanup Branch

Date

Part 2

Decision Summary

Part 2 – Decision Summary

2.1 Site Name, Location, and Description

The NHOU is one of two geographically-defined operable units within the San Fernando Valley (Area 1) Superfund Site. The NHOU comprises approximately 4 square miles of contaminated groundwater underlying an area of mixed industrial, commercial, and residential land use in the community of North Hollywood (a district of the City of Los Angeles). The NHOU is approximately 15 miles north of downtown Los Angeles and immediately west of the City of Burbank, and has approximate Site boundaries of Sun Valley and Interstate 5 to the north, State Highway 170 and Lankershim Boulevard to the west, the Burbank Airport to the east, and Burbank Boulevard to the south (see Figure 1).

The EPA is the lead agency for the current and planned future groundwater remedial activities at the NHOU. The EPA's response activities at the NHOU are and have been conducted under the authority established in the federal Superfund law, the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), as amended, 42 U.S.C. Section 9601 et seq. The lead state agency is the California Department of Toxic Substances Control (DTSC). The Los Angeles Regional Water Quality Control Board (RWQCB) has provided and continues to provide substantial support, particularly with the investigation and cleanup of sources of contamination in the SFV. The expected source of cleanup monies for the NHOU is an enforcement settlement with the Potentially Responsible Parties (PRPs).

2.2 Site History and Enforcement Activities

2.2.1 Site History

Prior to World War II, most land in the SFV was occupied by farms, orchards, and ranchland. By 1949, after the war, nearly all the land in Burbank and North Hollywood was occupied by housing developments, industrial facilities, retail establishments, and the Burbank Airport. Accompanying these land use changes in the 1940s was a substantial increase in population and groundwater withdrawals from the SFV. In the 1950s, the North Hollywood, Erwin, Whitnall, and Verdugo Well Fields were constructed by the LADWP in the North Hollywood area to meet the increasing demand for water. In 1968, groundwater withdrawals from the SFV were reduced to achieve "safe yield" from the basin, and more surface water was imported to the basin from external sources.

In 1979, industrial contamination was found in groundwater in the San Gabriel Valley (to the east of the SFV), prompting the California Department of Public Health (CDPH; formerly the California Department of Health Services) to request that all major water providers in the region, including those in the SFV, sample and analyze groundwater for potential industrial contaminants. Trichloroethylene (TCE) and tetrachloroethylene (PCE) were consistently detected in a large number of production wells in the SFV at concentrations greater than Federal and State MCLs for drinking water.

TCE and PCE were widely used in the San Fernando Valley starting in the 1940s for dry cleaning and for degreasing machinery. Disposal was not well regulated at that time, and releases

from a large number of facilities throughout the eastern SFV have resulted in the large plume of VOC-contaminated groundwater that extends from the NHOU to the southeast (see Figure 2). To replace wells within the NHOU area contaminated by TCE and PCE, and to provide more operational flexibility for groundwater recharge and pumping in the SFV, LADWP constructed the Rinaldi-Toluca Well Field in 1988 and 1989, and the Tujunga Well Field in 1993 (see Figure 1).

2.2.2 Federal, State, and Local Site Investigations and Remedial Actions

Based on the significant levels of groundwater contamination present in the SFV and the impact of that contamination on numerous municipal water supply wells, EPA added four SFV Sites to the NPL in 1986 and defined them as areas of regional groundwater contamination. Three of the four Sites (Areas 1, 2 and 4) are contiguous areas within whose boundaries are well fields that serve the water supply systems for the cities of Los Angeles, Burbank and Glendale. There is a large, continuous plume of groundwater contamination that runs through these three Sites. The fourth Site, Area 3, lies in the Verdugo basin, a geographically separate area of the eastern San Fernando Valley (see Figure 1).

In the SFV Area 1 Site, located at the upgradient end of the contaminated groundwater plume, the selection and implementation of the initial interim remedy – the Existing NHOU Extraction and Treatment System – for the LADWP’s North Hollywood well field was given fast-track status because of the potential for contamination to spread to other well fields and areas of uncontaminated groundwater. In 1986, LADWP completed the *Operable Unit Feasibility Study for the North Hollywood Well Field Area of the North Hollywood-Burbank NPL Site* (LADWP, 1986), which was the basis for selection and implementation of the Existing NHOU Extraction and Treatment System. The 1987 ROD for the Site selected the Existing NHOU Extraction and Treatment System as an interim groundwater containment remedy.

In 1989, LADWP constructed the Existing NHOU Extraction and Treatment System with financial support from EPA. The Existing NHOU Extraction and Treatment System consists of eight groundwater extraction wells (NHE-1 through NHE-8), an air-stripping treatment system to remove VOCs from the extracted groundwater, activated carbon filters to remove VOCs from the air stream, and ancillary equipment. The treated groundwater is discharged into an LADWP blending facility where it is combined with water from other sources before entering the LADWP water supply system. The Existing NHOU Extraction and Treatment System commenced operation in December 1989 and remains in operation today.

In 1989, EPA issued a ROD for the Burbank OU (BOU) of the SFV Area 1 Site. That ROD also selected an interim remedy (containment) for the VOC-contaminated groundwater within the Burbank area, where ten of the city’s water supply wells had been shut down due to contamination. The BOU remedy, which provides treated water for the City of Burbank’s water supply system, began operation in 1996 and remains in operation to this day.

In December 1992, a remedial investigation (RI) for the SFV groundwater basin, including installation and subsequent regular monitoring of 84 groundwater wells, was completed under a cooperative agreement between EPA and the LADWP. The RI was conducted to evaluate the groundwater quality throughout the SFV basin and assist in identifying the best treatment method(s) and optimal locations to install groundwater treatment systems to address the SFV groundwater contamination.

EPA listed the SFV Sites as groundwater only, with the intent to focus on addressing the regional groundwater contamination, with an agreement with the state agencies to address the sources. From the late 1980s to late 1990s, EPA provided funds to RWQCB to conduct assessments of facilities in the SFV to determine the extent of solvent usage and to assess past and current chemical handling, storage, and disposal practices. These investigations were conducted pursuant to RWQCB's Well Investigation Program and resulted in source remediation activities under RWQCB oversight at several facilities within the SFV, including two within the NHOU. Source investigations and remediation activities are currently in progress under the lead of RWQCB and DTSC.

In 1993, 1998, 2003, and 2008, EPA conducted five-year reviews (as required by CERCLA) to evaluate the protectiveness of the NHOU interim remedy. The *Third NHOU Five-Year Review* (EPA, 2003) reported that the TCE and PCE groundwater plume that the remedy was designed to capture was migrating vertically and laterally beyond the remedy's zone of hydraulic control. This conclusion was based largely on EPA's evaluation of the current NHOU groundwater conditions and LADWP findings in the *Draft Evaluation of the North Hollywood Operable Unit and Options to Enhance Its Effectiveness* (LADWP, 2002). The *Final Evaluation of the North Hollywood Operable Unit and Options to Enhance Its Effectiveness* (LADWP, 2003) also raised concerns regarding detections of total chromium and hexavalent chromium in extraction well NHE-2 of the NHOU interim remedy. Well NHE-2 is located just a short distance from the former Bendix facility, one of the major VOC sources in the NHOU.

In July 2006, after a year of unusually high rainfall and rising groundwater levels in the SFV, the total chromium concentration detected at NHOU extraction well NHE-2 began to increase. Chromium was used in the metal plating and aerospace industry (metal fabrication), as well as for corrosion inhibition in industrial cooling towers, from the 1940s through the 1980s. It was also used extensively at the former Bendix facility. In 2007, the elevated concentrations of chromium at well NHE-2 caused total chromium concentrations in the combined NHOU treatment system effluent to exceed 30 micrograms per liter ($\mu\text{g/L}$) (60 percent of the state MCL). As a result, CDPH advised LADWP to shut down well NHE-2 or divert the water produced by the well to a nonpotable use. Chromium concentrations at this well have subsequently ranged from approximately 280 to 440 $\mu\text{g/L}$. In addition, 1,4-dioxane was detected at well NHE-2 during 2007 and 2008 at concentrations ranging from 4 to 7 $\mu\text{g/L}$. There is no MCL for 1,4-dioxane, but the CDPH notification level for 1,4-dioxane is 3 $\mu\text{g/L}$.

Extraction well NHE-2 remained shut down until September 2008, when the installation of a wellhead VOC treatment unit and modification of the discharge piping were completed, which allowed this well to return to service. The NHE-2 effluent, which still contains elevated levels of chromium, is currently discharged to the Los Angeles Bureau of Sanitation sewer system. This work was conducted by Honeywell International (a corporate successor to Bendix) as an interim measure, pursuant to a Cleanup and Abatement Order (CAO) from RWQCB that requires Honeywell to clean up the chromium contamination and to restore lost water caused by the shut down of well NHE-2. A long-term wellhead treatment system for well NHE-2, including treatment for chromium and, if necessary, 1,4-dioxane, to meet drinking water standards is expected to be implemented pursuant to the RWQCB CAO prior to the implementation of the NHOU Second Interim Remedy.

2.2.3 History of CERCLA and State Enforcement Actions

Following construction and start up of the Existing NHOU Extraction and Treatment System, EPA issued general and special notice letters to PRPs. In 1996 and 1997, EPA reached two separate settlements with PRPs in which the settling parties agreed to pay EPA's past costs and fund operation of the Existing NHOU Extraction and Treatment System for the remainder of its fifteen-year term. In 2008, when the funds collected pursuant to the 1996 and 1997 settlements were close to being exhausted, EPA entered into an administrative order on consent with a number of parties from 1996 and 1997 settlements and issued a unilateral administrative order to the remaining viable parties in order to secure funding to continue operating the Existing NHOU Extraction and Treatment System until the Second Interim Remedy is constructed and operational. In preparation for the selection and implementation of the Second Interim Remedy, EPA has conducted additional PRP search activity.

The RWQCB has issued CAOs to two parties in the NHOU. In December 1987, Lockheed was issued a CAO (No. 87-161) directing it to remediate contaminated soil and groundwater at Plant B-1 (in the BOU) and to complete a comprehensive Site assessment at all of Lockheed's other Burbank Airport facilities, including Plants B5 and C1 (in the NHOU), to determine the sources and extent of soil and groundwater contamination. The RWQCB issued a CAO in February 2003 (No. R4-2003-037) to Honeywell International, Inc., for VOC and chromium contamination in groundwater at the former Bendix facility in North Hollywood. This CAO was amended in April 2007 to include investigation and mitigation of emerging contaminants at the former Bendix facility and to address elevated chromium concentrations at NHOU extraction well NHE-2.

2.3 Community Participation

After listing the SFV Area 1 Superfund Site on the NPL, EPA developed a Community Involvement Plan that outlined the types of activities envisioned to keep the local community informed. Throughout its involvement in the SFV, EPA has kept State agencies, cities, businesses, residents and property owners in and near the Site informed of its activities and the results of its studies via periodic newsletters. These newsletters and other documents referred to in this ROD are available to the public as part of the administrative record file at the EPA Region 9 Superfund Records Center in San Francisco, California. The administrative record is also available for public review at the following information repositories:

- City of Los Angeles Central Library, Science & Technical Department: 630 West 5th Street, Los Angeles, CA, 90071
- North Hollywood Regional Branch Library, 5211 Tujunga Avenue, North Hollywood, CA, 91601
- Burbank Public Library, Central Library, 110 North Glen Oaks Blvd., Burbank, CA, 91502
- Glendale Public Library, 222 East Harvard St., Glendale, CA, 91205

The Focused Feasibility Study (FFS) report and Proposed Plan for the NHOU Second Interim Remedy were made available to the public in July 2009. The notice of the availability of the FFS

and Proposed Plan for NHOU was published in the Daily Breeze on July 8, 2009. EPA held a public meeting in Burbank on July 21, 2009, to present the Proposed Plan to the community and other NHOU stakeholders. At this meeting, EPA representatives were also available during an open house session to answer questions about the NHOU and the remedial alternatives evaluated in the FFS.

The original public comment period on the Proposed Plan was set for July 13 to August 10, 2009. An extension to the public comment period was requested shortly after the public meeting and, as a result, it was extended to September 10, 2009. The public was notified of this extension through a public notice published in the Daily Breeze on August 8, 2009, a flyer sent to the NHOU mailing list, and an email notice sent to state and local agencies, elected officials, PRPs and other stakeholders. EPA's responses to the comments received during this period are included in the Responsiveness Summary, which is Part 3 of this ROD.

2.4 Scope and Role of Operable Unit

2.4.1 Role of Operable Unit

This section briefly describes the NPL Sites in the eastern SFV, to provide context for the role of the selected NHOU remedy and how it relates to the response actions underway in the nearby Burbank and Glendale OUs.

As noted earlier, there are four NPL Sites in the eastern SFV:

- Area 1 – North Hollywood: made up of the NHOU and the Burbank Operable Unit (BOU)
- Area 2 – Crystal Springs: includes the Glendale North and Glendale South Operable Units (referred to collectively as the Glendale OU or GOU)
- Area 3 – Verdugo
- Area 4 – Pollock

All of these Sites were listed on the NPL as “groundwater only” Sites, i.e., only the regional groundwater contamination was intended to be addressed by EPA's Superfund program. Due to the vast size of each of these Sites, it was agreed with the State that it would address the vadose zone contamination from sources, and EPA would address the groundwater contamination.

EPA has issued RODs for the NHOU (1987) and the BOU (1989) in the Area 1 NPL Site, the Glendale OUs (1993) in the Area 2 NPL Site, and the Area 3 (Verdugo) NPL Site. In the cases of the Area 1 and Area 2 Sites, EPA selected interim pump-and-treat remedies to “slow down or arrest” the migration of VOC-contaminated groundwater and remove contaminant mass. The purpose of these interim remedies was to stop the further spread of contamination as much as possible and begin to remove contaminant mass from the aquifer while the state worked on source identification and cleanup. EPA also planned to further characterize the regional groundwater contamination and aquifer characteristics to provide the basis for evaluating and selecting additional response actions leading to a final remedy at each Site.

In 2004, EPA issued a no-action ROD for the SFV Area 3 (Verdugo) Site, which was subsequently deleted from the NPL in October 2004. No Superfund remedy has been selected by

EPA for the Area 4 Site. However, in 1998, LADWP completed construction of the Pollock Wells Treatment Plant, which enabled LADWP to reactivate the Pollock well field. LADWP continues to operate the Pollock treatment plant to remove VOCs from groundwater, which is then used as part of the City's water supply system.

The Existing NHOE Extraction and Treatment System has been operating since 1989, and the BOE interim remedy has been operating since 1996. The GOU interim remedy, which consists of two extraction well fields and one treatment plant, began limited operations in August 2000 and achieved full operational capacity in June 2002. The treated water from the BOE and GOU remedies is delivered to the cities of Burbank and Glendale, respectively, for use in their municipal water supply systems.

The Second Interim Remedy addresses groundwater contamination in that part of the eastern SFV at the upgradient end of a continuous plume of VOC-contaminated groundwater that extends from the North Hollywood area down through Burbank and Glendale and into the Pollock area (see Figure 2). The primary role of the Second Interim Remedy for the NHOE is to improve containment of contaminated groundwater in the North Hollywood area (including the areas of highest contamination) in order to limit its migration downgradient and to prevent further contamination of LADWP production (water-supply) wells.

The direction of regional groundwater movement in the eastern SFV is generally south and southeast; therefore, groundwater contamination that escapes capture in the NHOE will tend to migrate towards the BOE and GOU. The primary roles of the BOE and GOU remedies are to contain groundwater contamination in the Burbank and Glendale areas, respectively. Secondary roles for each of the remedies in these OUs (NHOE, BOE, and GOU) include reduction of contaminant mass in groundwater through treatment.

2.4.2 Scope of Response Action

Selection and implementation of the Second Interim Remedy in the NHOE is intended to address the continued presence of contaminated groundwater in the vicinity of the LADWP production well fields within and adjacent to the North Hollywood area as well as uncertainties about lateral and vertical extent of the VOC plume in certain parts of the NHOE. The NHOE plume contains significant VOC contamination, along with the localized areas where chromium and other emerging chemicals exceed the MCLs or state notification levels. The Existing NHOE Extraction and Treatment System is not designed to remove chromium or the other emerging contaminants, and it is unable to achieve adequate capture of the VOC plume.

The scope of the Second Interim Remedy is:

1. Containment of the contaminant plume in the NHOE to the extent practicable, including containment of the highest-concentration VOC, chromium, and emerging contaminant plumes in groundwater in the immediate vicinity of the Existing NHOE Extraction and Treatment System. This will prevent the further migration of contaminated groundwater to the nearby Rinaldi-Toluca and North Hollywood West production wells and to areas of the aquifer with significantly lower contaminant concentrations.
2. Expansion of the NHOE groundwater monitoring well network to adequately monitor performance of the Second Interim Remedy and provide data required to optimize future system performance.

The scope of the Second Interim Remedy does not include restoration of the aquifer (i.e., attainment of MCLs and other groundwater cleanup goals in the aquifer) within the NHOU. This is because additional data are needed in some areas of the aquifer where the extent of contamination is not completely delineated before EPA can determine what additional remedial actions, if any, are needed to address these other areas of groundwater contamination. Additional data obtained during design and implementation of the Second Interim Remedy is expected to provide the basis for EPA's development of a final remedy for the NHOU. In the meantime, EPA considers it important to implement the Second Interim Remedy as soon as practicable to prevent further migration of the contaminant plumes, as described above, as well as to collect additional data to evaluate the need for (and scope of) further action within the NHOU. The Second Interim Remedy will be consistent with implementation of the final remedy for the NHOU and the SFV Area 1 Site, including any additional response actions for the Burbank OU.

2.5 Site Characteristics

2.5.1 Conceptual Site Model

For the San Fernando Valley (Area 1) Site, the conceptual Site model consists of past spills, leaks, or other releases of hazardous contaminants that have occurred at several sources within the NHOU, which has resulted in significant groundwater contamination that poses a potential risk to human health via the use of contaminated groundwater for potable water supply.

Significant releases of VOCs (primarily TCE and PCE) and other contaminants have occurred at several sources within the NHOU, including the former Bendix facility in North Hollywood and the Lockheed facilities near the western end of the Burbank Airport, resulting in contamination of underlying soil and groundwater. Two hot spots of VOC contamination, where concentrations are greater than 1,000 µg/L, are present in shallow groundwater in the immediate vicinity of these facilities (Figure 3). In deeper groundwater, localized areas of high VOC concentrations also exist, although concentrations are lower than those found in the shallow groundwater hot spots (Figure 4).

High concentrations of hexavalent and total chromium (see Figure 5), together with elevated levels of other emerging contaminants (most notably 1,4-dioxane) have also been detected in groundwater below the former Bendix facility. Other facilities may have discharged chromium and other emerging contaminants that impacted groundwater quality within NHOU; however, the highest concentrations detected to date (by three orders of magnitude for chromium) occur at, and downgradient from, the former Bendix facility.

Groundwater in the NHOU generally flows south and southeast, approximately parallel to the axis of the Existing NHOU Extraction and Treatment well field. Much of the contaminated groundwater present near the extraction well field is "captured" by the extraction wells and pumped from the aquifer. Groundwater that is not captured by the Existing NHOU Extraction and Treatment System, including groundwater in areas of the aquifer outside of the capture zone for the NHOU extraction wells, is withdrawn by LADWP water supply wells in and near the NHOU, or by the extraction well fields of the Burbank and Glendale OU remedies to the east and southeast (Figure 2).

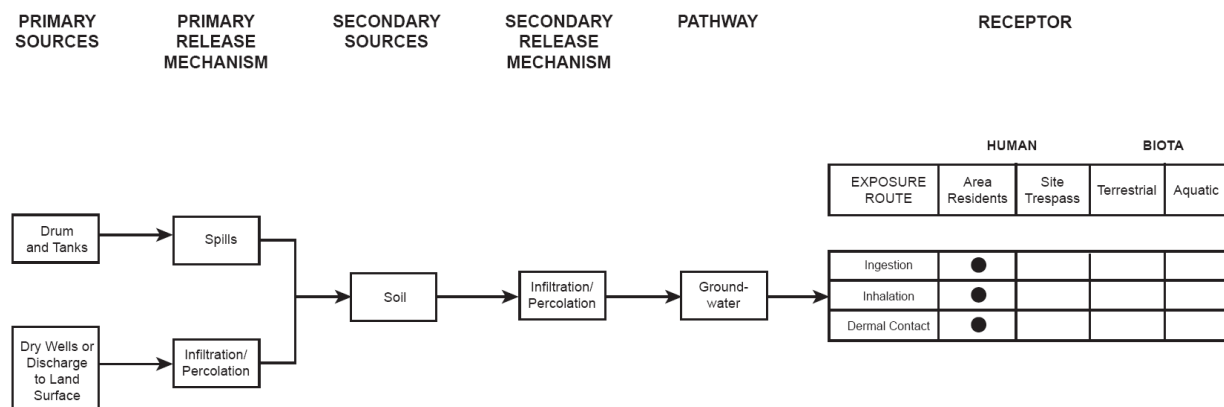
Some of the VOCs, chromium, and emerging contaminants that have spilled or leaked in the NHOU remain in the vadose zone. In 2006, a rising water table in the NHOU apparently intersected a substantial mass of VOCs and chromium in the vadose zone at the former Bendix facility (at an elevation that had not been saturated for several years), causing concentrations to increase an order of magnitude or more at downgradient wells, including NHOU extraction well NHE-2. Honeywell International, which has assumed responsibility for the former Bendix facility by virtue of a corporate merger, is currently conducting *in situ* remediation of hexavalent chromium in the vadose zone and groundwater at the former Bendix facility to mitigate this contaminant threat to groundwater.

The Existing NHOU Extraction and Treatment System was designed to remove VOC contaminant mass and contain the groundwater plume in the most contaminated portions of the NHOU, which are primarily located downgradient from the former Bendix facility and the Lockheed facilities. For several reasons, the design flow rate of 2,000 gallons per minute (gpm) for the first interim remedy has not been met, and as a result, the degree of plume containment has been less than intended. A key factor is that extraction well NHE-1 was shut down before the system became operational because of changes in groundwater conditions resulting in insufficient groundwater yield, and it has not been pumped since the system began operations in December 1989. Additional factors include declining groundwater levels, maintenance problems, and periodic shutdowns of extraction well NHE-2 due to excessive chromium concentrations.

The Existing NHOU Extraction and Treatment System's effectiveness is also currently limited because it was designed to extract and treat groundwater primarily from Depth Region 1, where groundwater contamination was known to exist in the 1980s. However, in the intervening years, substantial TCE and PCE concentrations have been detected in Depth Regions 2 and 3 in the NHOU. With the exception of extraction well NHE-6, the NHOU extraction wells are screened in Depth Region 1 and the upper part of Depth Region 2 to maximum depths ranging from 270 to 300 feet below ground surface (bgs). Elevated concentrations of TCE and PCE have now been detected in the lower part of Depth Region 2 and in Depth Region 3 in areas north of extraction well NHE-2 and south of extraction wells NHE-7 and NHE-8, and the extraction system is incapable of completely containing these deeper contaminant plumes. This has allowed migration of TCE and PCE contamination to nearby LADWP well fields including the Rinaldi-Toluca well field and the North Hollywood West well field.

Because the San Fernando Valley (Area 1) Site is considered a groundwater-only Site and the SFV groundwater is used by LADWP, Burbank, and Glendale for municipal drinking water supply, the exposure pathway considered in the human health risk assessment was residential use of groundwater for potable water supply (with exposure occurring via ingestion and inhalation). The conceptual Site model is graphically illustrated in Figure 6. Groundwater/surface water interactions do not occur within the NHOU, and as a result, the ecological risk posed by contaminants in groundwater is negligible.

Figure 6: Conceptual Site Model



2.5.2 Overview of the Site

The NHOU lies within the San Fernando Valley, which is an alluvial basin in the south-central portion of the Transverse Ranges of Southern California. The SFV is bordered on the east by the Verdugo Mountains, on the west by the Simi Hills, on the north by the Santa Susana and San Gabriel Mountains, and on the south by the Santa Monica Mountains. Average annual precipitation in the SFV (valley floor) is 16.48 inches. The San Fernando Valley is extensively developed, dominated by residential, retail, and industrial land use in the area of the NHOU.

The area of the NHOU is approximately 4 square miles, and is characterized by a relatively flat topographic surface that slopes gently to the south-southeast from approximately 800 feet above mean sea level (msl) in the north, to approximately 600 feet msl in the south. A concrete-lined flood control channel, the Central Branch of Tujunga Wash, is present along the western edge of the NHOU. The Los Angeles River, also concrete-lined in the vicinity of North Hollywood, is present south of the NHOU and drains stormwater runoff from most of the SFV, including North Hollywood (see Figure 1).

The NHOU is situated in the eastern half of the San Fernando Valley basin, which is underlain by alluvial deposits consisting of coarse materials, such as sands and gravels, interbedded with localized lenses of clays and silts. This portion of the basin has some of the best aquifer characteristics (from a water production perspective), and the well fields within the vicinity of the NHOU provide a large proportion of the groundwater produced from the basin. Locally, groundwater flow is influenced by well field pumping and by groundwater recharge at the Hansen, Branford, and Tujunga spreading grounds, which are located north of the NHOU. These spreading grounds are used by LADWP to increase infiltration of storm water runoff from streams issuing from the San Gabriel Mountains, rather than allowing most of this water to flow out of the basin as surface water.

The depth to groundwater in nonpumping wells near the NHOU extraction well field is approximately 240 to 250 feet bgs. Groundwater levels measured at most NHOU monitoring wells declined approximately 20 to 50 feet from the mid-1990s to 2004, which corresponds to increases in groundwater production and declines in recharge in the SFV. Pumping groundwater

levels at the NHOU extraction wells reportedly approached the depths of the pump intakes in 2003 to 2004, near the bottom of the screened intervals, in the range of approximately 260 to 290 feet bgs. This condition limited extraction well pumping rates.

Horizontal hydraulic gradients in the eastern SFV are generally south and east, toward the Los Angeles River Narrows, where essentially all groundwater and surface water outflow from the SFV occurs. In the NHOU, horizontal hydraulic gradients range from south to southeast, with the active LADWP production well fields having localized effects on groundwater flow. Since the original ROD for this Site, the groundwater flow direction near the NHOU extraction system has changed in response to seasonal and annual variations in pumping rates at the nearby Rinaldi-Toluca Well Field (to the northwest), the western portion of the North Hollywood Well Field (to the west), and the Whitnall Well Field (to the south). Pumping in the BOU (to the east) and more distant well fields in the NHOU has also affected hydraulic gradients and groundwater flow directions, although to a lesser extent.

Groundwater flow velocities in the NHOU were estimated during the RI to range from approximately 290 to 1,000 feet per year, depending on location. Estimated groundwater flow velocities are generally highest in the area of the NHOU extraction system where aquifer hydraulic conductivities are highest.

2.5.3 Sampling Strategy

In 1985, groundwater contamination by VOCs was detected in water supply wells in the SFV, including the areas that later became the four NPL Sites. By 1992, EPA had constructed and begun monitoring a network of 84 groundwater monitoring wells in the eastern SFV (referred to as “RI monitoring wells”), including the NHOU. Additional monitoring wells were constructed by others at several industrial facilities in and near the NHOU during the 1980s and 1990s. More recently (since 2003), Honeywell has constructed several new monitoring wells to delineate the extent and direction of contaminant migration from the former Bendix facility in North Hollywood. Most of the RI and other monitoring wells in the NHOU are sampled and analyzed periodically (typical sampling frequency ranges from quarterly to annually) for chemicals of potential concern (COPCs).

In addition to groundwater sampling, many of the facility-specific investigations directed by RWQCB and DTSC also included collection and analysis of soil samples and/or soil vapor samples to delineate contamination in near-surface and deep soils at facilities suspected as source areas for COPCs.

2.5.4 Contaminant Source Areas

While EPA is the lead agency for addressing groundwater contamination at the SFV NPL Sites, investigation and cleanup at the source areas have been managed by the RWQCB. From the late 1980s to late 1990s, EPA provided funds to the RWQCB to conduct facility assessments in the SFV. These investigations were conducted pursuant to the RWQCB’s Well Investigation Program and resulted in source remediation activities at facilities within the SFV. Many of these investigations and source remediation activities are still in progress and will continue because they are important to ensure that the groundwater remedy is maximally effective and the groundwater quality improvements gained by the NHOU remedy are sustained over time.

Of the many facilities investigated by DTSC and RWQCB, approximately 25 have been ordered to sample for contaminated soils. Of these 25 facilities, the former Bendix facility (for which

Honeywell International, Inc. has assumed responsibility) and Plants C-1 and B-5 at the former Lockheed Martin Corporation facility have been identified as the largest contributors of VOCs and chromium to the NHOU. Both Honeywell and Lockheed have taken steps to remove or otherwise address contaminated soil on these properties.

At its facilities in the San Fernando Valley, Lockheed used a variety of solvents, thinners, sealants, adhesives, oils, cleaners, lubricants, and paints from approximately 1936 – 1991. Soon after the San Fernando Valley NPL sites were identified, the RWQCB issued Lockheed a CAO requiring groundwater quality assessments and soil cleanup at the contaminated sites. Soil investigations conducted from 1986-1993 revealed that Plant C-1, located in the western portion the Burbank airport, was contaminated with PCBs, VOCs, and petroleum hydrocarbons. In response, Lockheed installed 62 groundwater-monitoring wells and ordered soil removal where appropriate. By 1994, sampling showed that excavated areas had attained the cleanup goals set by the RWQCB, and Lockheed was issued a No Further Action (NFA) letter for VOC clean up in this area.

Soil gas samples and groundwater monitoring data suggested that Lockheed plant B-5, also located on the western end of the Burbank airport, was another source of VOC contamination in the NHOU, and groundwater and soil gas were continuously monitored at Plant B-5 from 1989-1998. In 1998, the RWQCB determined that the site was not contributing to further VOC contamination and issued a NFA letter. The RWQCB and the EPA are currently working with Lockheed to re-assess sites as potential chromium sources.

Through corporate mergers, Honeywell is now responsible for cleanup actions at three adjacent NHOU properties where Allied Signal-Aerospace Co. and Bendix Aviation, Ltd conducted operations from 1941-1992. Operations at these facilities involved the use of heavy metals, acids, cyanide, petroleum, chlorinated cleaning solvents, motor fuels, and hydraulic test oils. Honeywell began working with the RWQCB to investigate and remediate the three facilities in 1984. Honeywell's cleanup activities included installation of groundwater monitoring wells and multiple soil excavations. In 2003 the RWQCB issued Honeywell a CAO requiring additional groundwater quality assessments and soil removal at the three sites. Since the issuance of the CAO, Honeywell has installed additional groundwater monitoring wells, injection borings, and a soil vapor extraction remedy.

In 2007, the RWQB issued a General Waste Discharge Requirement permit to Honeywell that allows for the *in-situ* remediation of soil contaminated with hexavalent chromium. Once a complete model is developed, the RWQCB expects Honeywell to conduct further excavation and cleanup of its respective properties.

The EPA, DTSC, and RWQCB are in the process of evaluating additional sites where releases of contaminants may have occurred. As part of this effort, the State and EPA have launched several efforts aimed at identifying additional sources of VOCs and emerging contaminants, including a basin-wide (NHOU, BOU, and GOU) sampling effort aimed at locating additional sources of chromium. As potential sources are identified, the agencies will work cooperatively to identify the appropriate lead agency for oversight of investigation and cleanup work.

2.5.5 Types of Contamination and Affected Media

Operations at several industrial facilities in the NHOH have resulted in the discharge of COCs and COPCs to the vadose zone and the underlying groundwater. The primary COCs at the NHOH have historically been TCE and PCE. TCE and PCE are solvents that have been widely used as industrial cleaning and degreasing agents, are mobile in groundwater, and are known to have both carcinogenic and non-carcinogenic impacts on human health. Carbon tetrachloride, 1,1,1-trichloroethane (TCA), and several other chlorinated VOCs have also been detected in NHOH extraction wells, typically at lower concentrations than TCE and PCE.

Two emerging contaminants of concern, hexavalent chromium and 1,4-dioxane, have been detected in the last few years in one of the NHOH extraction wells at concentrations that exceed the MCL for chromium and the state's notification level for 1,4-dioxane. Both of these contaminants are mobile in groundwater and have both probable carcinogenic and non-carcinogenic impacts on human health. Chromium's industrial uses include metal plating operations and aviation and aerospace parts manufacturing. Hexavalent chromium was also used to inhibit corrosion in industrial cooling towers. 1,4-dioxane is a stabilizing agent that was added to chlorinated solvents such as TCE and TCA, and is often associated with VOC contamination in groundwater. 1,4-dioxane is also commonly found in some paint strippers, dyes, greases, varnishes, waxes, antifreeze, and aircraft deicing fluids.

The target medium for the EPA's Second Interim Remedy in the NHOH is groundwater. The uppermost layer of the aquifer contains the highest known concentrations and masses of VOC and chromium contamination, which are the primary targets of the Second Interim Remedy. Some contamination "hot spots" have been detected in deeper layers and will be further investigated by EPA so that appropriate action can be implemented for this deeper groundwater contamination.

2.5.6 Location of Contamination and Potential Routes of Migration

Groundwater contamination within the NHOH is present from the water table to depths exceeding 500 feet bgs, although certain contaminants (such as hexavalent chromium) are present primarily in the upper layer of the aquifer and/or only in localized areas. Since 1996, EPA has been defining aquifer zones in the NHOH by four depth regions and has used these depth regions as the basis for mapping the extent of contamination. All four depth regions are below the water table and correspond to common screened intervals (typically placed in more permeable strata) for monitoring and production wells in the NHOH. The depths and thicknesses of the depth regions can vary depending on location within the NHOH. Following are descriptions of the four depth regions:

- **Depth Region 1.** This depth interval occurs from approximately 200 to 280 feet bgs, with a typical thickness of 75 feet; it includes the screened intervals for most shallow monitoring wells and some older production wells.
- **Depth Region 2.** This depth interval ranges from approximately 280 to 420 feet bgs, with a typical thickness of 140 feet; it includes highly permeable deposits that are penetrated by most production wells in the NHOH.

- **Depth Region 3.** This depth interval occurs from approximately 420 to 660 feet bgs, with a typical thickness of 240 feet; it can be very permeable and includes the screened intervals for many of the newer LADWP production wells in the NHOU.
- **Depth Region 4.** This depth interval includes all of the basin-fill alluvial deposits deeper than 660 feet bgs, with a typical thickness ranging from 100 feet to more than 500 feet; few wells have penetrated this depth region.

The lateral and vertical extent of the primary COCs (TCE, PCE and hexavalent chromium) are shown on Figures 3 through 5 and discussed in more detail below.

TCE and PCE

Figure 3 shows the TCE and PCE concentration contours in Depth Region 1, which are based on the constituent with the higher concentration at each data point from January 2003 through December 2007. This period was selected as being representative of recent conditions in the NHOU, which are most relevant to the selection of a groundwater remedy.

The data shown on Figures 3 and 4 indicate that TCE and PCE concentrations exceeding 5 µg/L are present in a wide area of the NHOU and continue into the BOU, to the east. With few exceptions, TCE concentrations are greater than PCE concentrations within the NHOU, and TCE “hot spots,” with concentrations ranging from 50 to 2,900 µg/L, occur within Depth Region 1 of the NHOU.

An area of particularly high TCE concentrations (ranging from 50 to greater than 1,000 µg/L) is centered near the southern boundary of the former Bendix facility. Another area of high TCE concentrations is centered on a Lockheed facility monitoring well near the western end of the Burbank airport runway, with a recent peak concentration of 1,200 µg/L.

In Depth Regions 2 through 4, TCE and PCE concentrations in excess of the MCL are also distributed over a substantial area of the NHOU (see Figure 4), although concentrations are much lower than in Depth Region 1. Notable areas with elevated concentrations include the following:

- Northeast of the Rinaldi-Toluca Well Field
- Immediately south of the former Bendix facility
- East of the Whitnall Well Field

Chromium

Reported total chromium concentrations in the NHOU are highly variable at some wells partly because of differing analytical methods used by the various laboratories and variations in sample collection, filtration, and preservation during different investigations. These investigations were performed by various state and federal agencies and property owners or operators. Over time, analytical methods, sample collection and management processes, and regulatory guidance have been developed or updated to enhance the quality of chromium sampling and data results.

Total and hexavalent chromium detections in excess of the state MCL for total chromium of 50 µg/L are located at, or south (downgradient) of, the former Bendix facility. Total chromium concentrations have ranged as high as 48,000 µg/L in this area. Total chromium levels in the active NHOU extraction wells have reached maximum concentrations ranging from 2 µg/L at

NHE-8 to 440 µg/L at NHE-2. Historically (1990 through 2002), well NHE-2 has had the highest total and hexavalent chromium concentrations of all the extraction wells.

Concentrations of total and hexavalent chromium in Depth Regions 2 through 4 have been as high as 2,010 µg/L and 2,000 µg/L, respectively in the vicinity of the former Bendix facility. However, in most of the SFV, total and hexavalent chromium concentrations are typically elevated in only the uppermost aquifer zones.

Trace background concentrations of chromium occur in SFV groundwater, typically at levels below 3 µg/L, as a result of naturally occurring chromium in the soils comprising the aquifer material.

Emerging Chemicals

Available recent data (January 2003 to December 2007) for several of the emerging chemicals of potential concern, including 1,2,3-trichloropropane (TCP), 1,4-dioxane, N-Nitrosodimethylamine (NDMA), and perchlorate, were reviewed as part of the FFS for the NHOU. In general, the concentrations of TCP, NDMA, and perchlorate in the extraction wells are not expected to exceed the respective MCLs, and therefore will not require treatment. The results for 1,4-dioxane are summarized below.

1,4-dioxane: The state established a drinking water notification level of 3 µg/L for 1,4-dioxane in 1998. Neither CDPH nor EPA has established an MCL for 1,4-dioxane in drinking water. 1,4-dioxane, a semivolatile organic compound, is commonly associated with TCA and TCE contamination in groundwater. In Depth Region 1, 1,4-dioxane has recently been detected in groundwater samples from 20 monitoring wells in or adjacent to NHOU at concentrations that exceed the state drinking water notification level. The highest concentrations of 1,4-dioxane in the NHOU were detected at the former Bendix facility. 1,4-dioxane was also detected at concentrations exceeding the notification level at NHOU extraction wells NHE-2 and NHE-4 at concentrations of 7 and 3.2 µg/L, respectively. In Depth Regions 2 through 4, 1,4-dioxane has been detected above the notification level at former Bendix facility monitoring wells.

All NHOU groundwater contaminants are present in the dissolved phase and will continue to migrate with the regional hydraulic gradient to the south and southeast via advective flow. If nearby LADWP water-supply well fields are pumped at sufficiently high rates, groundwater contamination may be drawn west and northwest toward these well fields. Dispersion, retardation, and biological degradation will affect contaminant migration to some degree. In certain parts of the eastern SFV (primarily Glendale), high groundwater levels can result in the discharge of groundwater in the unlined portions of the Los Angeles River.

There is no evidence to suggest that non-aqueous phase liquids (NAPLs) are present within the NHOU, either in the vadose zone or in groundwater.

2.6 Current and Potential Future Land and Water Uses

The land use in the SFV Area 1 Site, including the NHOU, consists of mixed residential, industrial, and commercial use. The SFV is fully developed and land uses in the NHOU are not expected to change significantly in the next 20 years or longer.

The SFV groundwater basin is an important source of drinking water for the Los Angeles metropolitan area, including the cities of Los Angeles, Glendale, Burbank, and San Fernando. The SFV is located in the Upper Los Angeles River Area (ULARA), which is under adjudicated water rights regulated by the ULARA Watermaster. Through court action in 1975, the City of Los Angeles was granted rights to all groundwater in the San Fernando Basin that is derived from precipitation within ULARA.

There are a number of production well fields in the eastern SFV, including six LADWP well fields located in or near the NHOU. The output from the existing NHOU remedy accounts for approximately 1 to 2 percent of LADWP's total extraction from the SFV groundwater basin. The need for drinking water development in the eastern SFV, including the NHOU, is expected to increase over the next 20 years as restrictions on importing water to Southern California increase and imported water becomes more expensive.

2.7 Summary of Site Risks

Because groundwater is the primary contaminated medium at the Site, and groundwater/surface water interactions do not occur within the NHOU, there are no potentially significant complete exposure pathways for ecological receptors. Therefore, this section focuses on human-health risks.

As part of the RI for the SFV in 1992, a baseline human-health risk assessment (1992 HHRA) was conducted. The baseline risk assessment estimates what risks the Site poses if no action were taken. It provides the basis for taking action and identifies the contaminants and exposure pathways that need to be addressed by the remedial action.

2.7.1 Identification of Chemicals of Concern

In the 1992 HHRA, the preliminary screening of compounds based on magnitude and toxicity was conducted to develop a list of potential chemicals of concern in the groundwater for the Upper Zone and the Lower Zone of the San Fernando Basin for the baseline risk assessment. This screening considered all of the compounds detected during the most current sampling of groundwater from all wells in the basin (September 1990 through May 1991). Table 1 summarizes the occurrence of selected COCs for the NHOU. The COCs for which EPA has selected a performance standard under this ROD are found in Table 6.

Table 1. Occurrence, Distribution, and Selection of Selected Chemicals of Concern**Exposure Medium:** Groundwater

Chemical of Potential Concern	Minimum Concentration^a (µg/L)	Maximum Concentration^a (µg/L)	Regional Screening Level (µg/L)^b
Benzene	0.19	1.3	0.41
Carbon Tetrachloride	0.089	13.1	0.20
Chloroform	0.059	31	0.19
1,1-Dichloroethane	0.066	30	2.4
1,2-Dichloroethane	0.1	3.7	0.15
Tetrachloroethylene	0.073	200	0.11
Trichloroethylene	0.057	3,900	1.7
Arsenic	0.08	83	0.045
Chromium (total)	0.005	48,000	110

Key:

µg/L = micrograms per liter

ND = not detected

N/A = not applicable

Notes:^aMin/max detected concentration above the minimum detection limit from January 2003 to December 2007.^bFrom EPA's April 2009 Regional Screening Level table; values shown are screening levels for tap water.^cHazard quotient is defined as (maximum concentration)/(screening toxicity value).**2.7.2 Exposure Assessment**

The major exposure pathways considered in the human-health risk assessment for the SFV NPL Sites, which includes the NHO, were those associated with use of contaminated groundwater. Groundwater within the NHO is used as a source of potable and non-potable water, and the pathway for human exposure is potentially complete if there is no treatment of the contaminated groundwater or monitoring to remove the contaminated drinking water wells from service.

Residential use of groundwater for potable supply was identified as the most significant exposure pathway (via ingestion and inhalation) because the NHO treated water is delivered to LADWP for municipal drinking water supply. Dermal exposure was considered in the baseline risk assessment, but was not considered significant compared to exposure via ingestion and inhalation. No impacts to indoor air (via the vapor intrusion pathway) or inhalation exposures for construction workers are likely due to the depth of contaminated groundwater (approximately 250 feet bgs).

2.7.3 Toxicity Assessment

Many of the VOCs found in the San Fernando Basin are or have been commonly used as industrial solvents. For the most part, they can be further characterized as belonging to one of two groups: chlorinated straight chain molecules and nonchlorinated aromatic ring compounds. The presence of the chlorine causes some health effects that are not caused by the benzene ring compounds (nonchlorinated). Similarly, the benzene ring causes biological effects unlike those caused by the chlorinated chain compounds.

Chronic exposure to VOCs can affect one or more of the following organs: the central nervous system (CNS), liver, kidney, bone marrow, and the blood or hematological system. The bone marrow is affected by benzene such that blood composition is altered. Red and white blood cell counts may also be depressed.

2.7.4 Health Risk Characterization

The baseline risk assessment conducted for the SFV RI in 1992 identified VOCs, in particular TCE and PCE, as the primary risk drivers for the SFV Superfund Sites, including the NHOU. TCE and PCE are classified as probable human carcinogens based on laboratory studies performed on animals. For carcinogens, risks are generally expressed as the incremental probability of an individual developing cancer over a lifetime as a result of exposure to the carcinogen. Excess lifetime cancer risk is calculated from the following equation:

$$\text{Risk} = \text{CDI} \times \text{SF}$$

Where: risk = a unitless probability (e.g., 2×10^{-5}) of an individual developing cancer
CDI = chronic daily intake averaged over 70 years (mg/kg-day)
SF = slope factor, expressed as (mg/kg-day)⁻¹

These risks are probabilities that usually are expressed in scientific notation (e.g., 1×10^{-6}). An excess lifetime cancer risk of 1×10^{-6} indicates that an individual experiencing the reasonable maximum exposure (RME) estimate has a 1 in 1,000,000 chance of developing cancer as a result of Site-related exposure. This is referred to as an “excess lifetime cancer risk” because it would be in addition to the risks of cancer individuals face from other causes such as smoking or exposure to too much sun. The chance of an individual developing cancer from all other causes has been estimated to be as high as one in three. EPA’s generally acceptable risk range for Site-related exposures is 10^{-4} to 10^{-6} .

The potential for noncarcinogenic adverse health effects is evaluated by comparing an exposure level over a specified period (e.g., life-time) with a reference dose (RfD) derived for a similar exposure period. An RfD represents a level that an individual may be exposed to that is not expected to cause any deleterious effects. The ratio of exposure to toxicity is called a hazard quotient (HQ). An HQ less than 1 indicates that a receptor’s dose of a single contaminant is less than the RfD, and that toxic noncarcinogenic effects from that chemical are unlikely. The Hazard Index (HI) is generated by adding the HQs for all chemicals of concern that affect the same target organ (e.g., liver) or that act through the same mechanism of action within a medium or across all media to which a given individual may reasonably be exposed. An HI less than 1 indicates that, based on the sum of all HQs from different contaminants and exposure routes, toxic noncarcinogenic effects from all contaminants are unlikely. An HI greater than 1 indicates that Site-related exposures may present a risk to human health.

The HQ is calculated as follows:

$$\text{Non-cancer HQ} = \text{CDI}/\text{RfD}$$

Where: CDI = chronic daily intake
RfD = reference dose

The CDI and RfD are expressed in the same units and represent the same exposure period.

The exposure point concentration used in the RME scenario in the SFV human health risk assessment was developed using concentrations of VOCs detected in the Upper and Lower aquifer zones (corresponding approximately with Depth Region 1 and Depth Regions 2 through 4, respectively) during sampling of groundwater monitoring wells in 1990 and 1991. The 95 percent upper confidence limit of the arithmetic mean concentration that a single receptor is

likely to encounter was considered to be the exposure point concentration for the RME scenario. The 95 percent upper confidence limits were calculated using regional data from the SFV, rather than data specifically from the NHOU. Results from the baseline risk assessment indicated that if groundwater from the Upper Zone in the SFV was to be used as a source of drinking water without treatment for VOCs, it would exceed acceptable carcinogenic and chronic (non-carcinogenic) risk levels for exposure either by ingestion or by inhalation of vapors during showering. If groundwater from the Lower Zone was to be used as a source of drinking water without treatment for VOCs, the carcinogenic and chronic risk levels for both exposure pathways were calculated to be within the acceptable range as defined by the NCP.

The primary contributors to carcinogenic risk from exposure to Upper Zone groundwater included TCE, carbon tetrachloride, PCE, 1,2-DCA, and arsenic. The total (combined) excess lifetime cancer risk for COCs and exposure scenarios calculated in the SFV RI for the Upper Zone ranged from 1×10^{-3} (arithmetic mean) to 2×10^{-2} (maximum).

For noncarcinogenic health effects, the hazard index for the RME scenario (ingestion and inhalation pathways combined) for contaminants in the Upper Zone was 5.4, with TCE being the primary contributor. Using the maximum exposure concentration, the HI for the Upper Zone was 34. Among the metals considered in the RI risk assessment, chromium had the highest hazard quotient, although the HQ for each of the metals in the Upper Zone was less than 1. For the Lower Zone, the hazard index was less than 1 for the RME scenario.

2.7.5 Basis for Action

Since the 1992 RI, much higher concentrations of total and hexavalent chromium, TCE, PCE, and other VOCs have been detected in the NHOU, particularly at the former Bendix facility. Recent concentrations of TCE detected in the NHOU have been up to 500 times greater than the MCL, and recent peak concentrations of total chromium have exceeded the state MCL by a factor of nearly 1,000. EPA regional screening levels (RSLs) for TCE and PCE in tap water, representing concentrations calculated to cause an excess lifetime cancer risk of 1 in 1,000,000, are 1.7 µg/L and 0.11 µg/L, respectively. The maximum recent TCE and PCE concentrations detected in groundwater in the NHOU were 2,900 µg/L and 170 µg/L, respectively.

Two RSLs for hexavalent chromium, as a chromic acid mist and as an aerosol mist, exist for tap water, representing the concentration calculated to result in exceeding a hazard index of 1. The RSL for hexavalent chromium as a chromic acid mist is 110 µg/L, and the RSL for hexavalent chromium as an aerosol mist is 730 µg/L. The maximum recent concentration of hexavalent chromium detected in the NHOU was 39,000 µg/L. An EPA RSL has not been developed for total chromium in tap water; however, the federal MCL is 100 µg/L, and the state MCL is 50 µg/L. The maximum recent concentration of total chromium detected in the NHOU was 48,000 µg/L. These maximum total and hexavalent chromium concentrations occurred in the immediate vicinity of the former Bendix facility.

These high concentrations of TCE, PCE, and chromium (both total and hexavalent) in groundwater represent a significant risk to human health if not treated prior to potable use.

The response actions selected in this ROD are necessary to protect public health or welfare or the environment from actual or threatened releases of pollutants or contaminants to groundwater which may present an imminent and substantial endangerment to public health or welfare.

2.8 Remedial Action Objectives

The Second Interim Remedy for the NHOU is intended to achieve the following Remedial Action Objectives (RAOs):

- Prevent exposure to contaminated groundwater, above acceptable risk levels.
- Contain areas of contaminated groundwater that exceed the MCLs and notification levels to the maximum extent practicable.
- Prevent further degradation of water quality at the Rinaldi-Toluca and North Hollywood West production wells by preventing the migration toward these well fields of the more highly contaminated areas of the VOC plume located to the east/southeast.
- Achieve improved hydraulic containment to inhibit horizontal and vertical contaminant migration in groundwater from the more highly contaminated areas and depths of the aquifer to the less contaminated areas and depths of the aquifer, including the southeast portion of the NHOU in the vicinity of the Erwin and Whitnall production well fields.
- Remove contaminant mass from the aquifer.

The improved containment of the contaminant plume called for in these RAOs can be achieved by increasing the number of extraction wells and the volume of contaminated groundwater that is extracted by the NHOU remedy. However, in some areas of the NHOU, high volume LADWP production wells currently capture part of the VOC plume (i.e., groundwater with VOC concentrations of 5 µg/L or greater). LADWP relies on these wells (particularly those in the Rinaldi-Toluca and North Hollywood West well fields) to meet its water supply needs and manages their use so as to ensure that drinking water standards are always met. Because these wells will continue to be used, it is not possible for the NHOU system to capture and contain all of the contaminated groundwater. Consequently, one of EPA's objectives is to improve containment of the high concentration areas of the plume to ensure that no further degradation of groundwater quality occurs in the vicinity of the Rinaldi-Toluca and North Hollywood West well fields.

Groundwater in the NHOU is known to be spreading into less contaminated portions of the aquifer and posing a threat to water supply wells because of the Existing NHOU Extraction and Treatment System's inability to completely capture the plume. Delaying action could result in the following:

- Continued contaminant migration, necessitating additional treatment, increasing costs, and complicating the operation of existing or planned treatment facilities.
- Increased likelihood that additional water supply wells in the SFV would have to be modified, removed from service, or operated intermittently, or that groundwater produced by additional wells would require treatment to remove contaminants.
- Increased cost, difficulty, and time required for containment of contaminant plumes or restoration of the aquifer because continued contaminant migration would increase the volume, contaminant concentrations, and potential COCs in that contaminated groundwater.

2.9 Description of Alternatives

In developing the remedial alternatives for the Site, EPA considered several organic and inorganic contaminants that have been identified in the NHOU since the mid-1990s. Hexavalent chromium is the emerging chemical of greatest concern. For this reason, options to treat dissolved total and hexavalent chromium were part of all alternatives considered for the Second Interim Remedy. In addition, wellhead treatment for 1,4-dioxane is expected to be implemented at well NHE-2 pursuant to an existing CAO issued by the RWQCB and such treatment was assumed to remain in place under all alternatives.

Based on the available information about the current nature and extent of groundwater contamination in the NHOU, the past performance of the existing remedy, and projections for future water withdrawals and recharge by LADWP, EPA developed a range of remedial action alternatives for achieving the RAOs described above. Nine remedial alternatives that incorporate different combinations of technologies, process options, and end uses of treated water have been developed.

2.9.1 Description of Remedy Components

Table 2 summarizes the major components of each alternative. Several of these components are common to all of the remedial alternatives, including Alternative 1, and several are common to Alternatives 2a through 5b. The principal differences between the remedial alternatives are the scale and approach taken for chromium treatment in the extracted groundwater, and the method for reuse of extracted and treated groundwater.

2.9.1.1 Remedy Components Common to All Alternatives

The following components are common to all the alternatives:

1. Develop and implement institutional controls that consist of a groundwater management plan to protect the effectiveness and integrity of the NHOU remedy from adverse impacts caused by LADWP's operation of drinking water production wells;
2. Install and add to the monitoring program approximately 37 new wells (see Figure 9 for proposed locations of monitoring wells) (However, approximately 25 wells have already been installed by Honeywell);
3. Implement well-head treatment for chromium at well NHE-2, with a capacity of at least 300 gpm. A wellhead treatment system is assumed to be implemented in 2009 or 2010 by Honeywell pursuant to the CAO issued by RWQCB. This system, however, is expected to be designed for a pumping rate of 140 gpm, which is the current NHE-2 pumping rate;
4. Implement well-head treatment for 1,4-dioxane at extraction well NHE-2, with a capacity of at least 300 gpm. The wellhead treatment system is assumed to be implemented in 2009 or 2010 by Honeywell under the CAO issued by the RWQCB; and,
5. Monitor the performance of the extraction wells and the treatment systems to ensure attainment of performance standards and evaluate the need to modify operations in response to changes in contaminant concentrations, aquifer conditions or other factors.

Table 2. Summary of Remedial Alternative Components

Remedial Alternative Component	Alternative 1	Alternative 2a	Alternative 2b	Alternative 3a	Alternative 3b	Alternative 4a	Alternative 4b	Alternative 5a	Alternative 5b
Institutional Controls (GW mgt plan to balance long-term effectiveness of remedy with public drinking water needs)	Yes (same for all alternatives)								
Groundwater Monitoring (continue existing monitoring and install new monitoring wells)	Yes (same for all alternatives)								
Groundwater Extraction	Continue existing 7 extraction wells at current pumping rates	Expand extraction well field to 11 wells							
Primary VOC Treatment	Continue existing air stripper	Refurbish existing air stripper and install a second air stripper							
Secondary VOC Treatment	None	LPGAC following each air stripper	None	LPGAC following each air stripper	None	LPGAC following each air stripper	None	LPGAC following each air stripper	None
End Use of Treated Groundwater	Continue delivery to LADWP	Continue delivery to LADWP	Reinjection	Continue delivery to LADWP	Reinjection	Continue delivery to LADWP	Reinjection	Continue delivery to LADWP	Reinjection
1,4-dioxane Treatment (wellhead treatment at NHE-2)	Yes								
Chromium Treatment	Wellhead treatment at NHE-2	Wellhead treatment at NHE-1 and NHE-2		<i>Ex situ</i> treatment for combined flow from NHE-1 and NHE-2		Wellhead treatment at NHE-2 & <i>ex situ</i> treatment at NHOU plant for combined flow from NHE-1 & 2 new extraction wells		<i>Ex situ</i> treatment at the NHOU plant for the combined flow from all extraction wells	

2.9.1.2 Remedy Components Common to “Action” Alternatives (Alternatives 2a through 5b)

The primary objective of Alternatives 2a through 5b (the “action” alternatives) is to improve hydraulic containment, particularly for highly contaminated groundwater in the NHOU. The major differences between the alternatives are the scale of chromium treatment and the end use of the water.

In addition to the components described above in section 2.9.1.1, the following components are common to Alternatives 2a through 5b, as follows:

1. Drill a new deeper well to replace NHE-1 to improve capture of the 5 µg/L VOC plume, to the extent possible. It is assumed that a new well will be required in order to achieve the necessary target pumping rate of 250 gpm; however, modification of the existing well may also be an option, and should be evaluated in the design;
2. Drill new deeper wells, or repair and/or modify existing extraction wells NHE-2, 4, and 5 to improve capture of the 5 µg/L VOC plume, to the extent possible;
3. Implement routine O&M for existing extraction wells NHE-3, 6, 7, and 8;
4. Construct new extraction wells (FFS modeling predicted that three new wells are needed) to improve hydraulic containment of highly contaminated groundwater present south of LADWP’s southern Rinaldi-Toluca wells and east of LADWP’s North Hollywood West Well Field;
5. Construct a new pipeline to connect the new extraction wells to the NHOU treatment plant; and,
6. Expand air stripping treatment capacity at the NHOU treatment plant Site, for primary VOC treatment. It is assumed that the existing air stripper would be refurbished and a second air stripper, similar in capacity to the original, would be installed and operated in parallel with the existing system.

End Use Options for Treated Water:

Alternatives 1, 2a, 3a, 4a, and 5a assume that the groundwater treated by the NHOU treatment plant and delivered to LADWP would continue to be blended by LADWP with water from other sources, and used in the drinking water system of the City of Los Angeles. Reinjection of treated groundwater into the aquifer using injection wells is assumed under Alternatives 2b, 3b, 4b, and 5b.

All of the “a” alternatives include delivery of the treated water to LADWP as the end use option for treated groundwater. All of the “a” alternatives, therefore, include:

- A secondary treatment system installed downstream from the air strippers to provide “double barrier” VOC treatment, as required by CDPH for domestic use of an extremely impaired water source.

Under the “b” alternatives, the treated water would be reinjected into the aquifer. Reinjection of the treated water would supplement recharge to the aquifer, making the water available for future pumping and use by LADWP. It is assumed that the injection wells would be located north (upgradient) of the NHOU extraction wells. In this configuration, the treated groundwater would

be reinjected into the aquifer at the northern boundary of the VOC and chromium plumes, and supplement the hydraulic gradient driving contaminated groundwater toward the extraction wells. The “b” alternatives include:

- Construction of new injection wells, a pipeline from the NHOU treatment plant to the injection wells, and new monitoring wells in the vicinity of the injection wells; and,
- Construction of a new VOC treatment facility to replace the existing system (LADWP owns the existing system, so a new system will have to be constructed to implement these alternatives).

2.9.1.3 Description of Alternatives

Alternative 1 – Existing NHOU Extraction and Treatment System

A no-action alternative, which is required by the NCP to provide a baseline for comparison to other alternatives, was evaluated in the 1987 ROD for the NHOU. The no-action alternative was eliminated from consideration in the 1987 ROD because “the contamination plumes (in the groundwater) would continue to migrate downgradient, rendering additional wells unusable.” Hydraulic gradients and contaminant plume locations in the aquifer system at the NHOU at present remain similar to the conditions in 1987, and although significant VOC mass has been removed by the existing NHOU system, contaminant concentrations in the aquifer remain significantly elevated relative to drinking water standards. Shutting down the existing NHOU treatment system now would result in the same outcome as the 1987 no-action alternative (i.e., further migration of contamination to water supply wells that renders those wells unusable and potential exposure of the public to contaminants in drinking water at unacceptable levels. Therefore, rather than reconsidering the no-action alternative, Alternative 1 consists of continued use of the Existing NHOU Extraction and Treatment System, with minor modification and increased monitoring. It includes all the common elements described above in Section 2.9.1.1.

Alternatives 2a and 2b – Expand Extraction Well System and Operate Chromium Wellhead Treatment Systems at Extraction Wells NHE-1 and NHE-2

Under Alternatives 2a and 2b, separate wellhead chromium treatment systems would be installed at NHE-1 and NHE-2.

In addition to the common components listed above in sections 2.9.1.1 and 2.9.1.2, Alternative 2a includes the following specific actions:

- Addition of wellhead chromium treatment at well NHE-1.
- Expansion of wellhead chromium treatment at well NHE-2 to accommodate a larger peak flow rate of approximately 300 gpm.
- Expansion of wellhead treatment for 1,4-dioxane at well NHE-2 to accommodate a larger peak flow rate of approximately 300 gpm.

Alternative 2b is nearly identical to Alternative 2a, but assumes reinjection of the treated groundwater into the aquifer rather than delivery to LADWP (and thus does not require the secondary VOC treatment system).

Alternatives 3a and 3b – Expand Extraction Well System and Operate Chromium Treatment System for Combined Effluent from Extraction Wells NHE-1 and NHE-2

Alternatives 3a and 3b were developed to evaluate the cost-effectiveness of operating a single chromium treatment system for the combined flow from wells NHE-1 and NHE-2, compared with operation of two individual wellhead chromium treatment systems at these wells.

Alternative 3a is nearly identical to Alternative 2a, except that *ex situ* treatment of chromium would be implemented at the NHOU groundwater treatment facility for the combined discharge of groundwater extracted from wells NHE-1 and NHE-2 instead of using individual wellhead treatment systems at these wells.

Alternative 3b is nearly identical to 3a, but assumes reinjection of treated water rather than delivery to LADWP (and thus does not require the secondary VOC treatment system).

Alternatives 4a and 4b – Expand Extraction Well System and Operate *Ex Situ* Chromium Treatment System for Multiple Extraction Wells

Groundwater modeling results conducted for the FFS indicate that under expected future SFV well field pumping scenarios, new extraction wells NEW-2 and NEW-3 would intercept groundwater containing high concentrations of chromium at levels similar to NHE-1 and NHE-2. Alternatives 4a and 4b include additional chromium treatment for both of these new extraction wells.

Alternative 4a includes the components common to all alternatives listed above in section 2.9.1.1 and 2.9.1.2, with the following specific actions:

- Expansion of wellhead treatment for chromium in the extracted groundwater from NHE-2 to accommodate a larger peak flow rate of approximately 300 gpm.
- Expansion of wellhead treatment for 1,4-dioxane at well NHE-2 to accommodate a larger peak flow rate of approximately 300 gpm.
- *Ex situ* treatment of chromium at the NHOU groundwater treatment facility for the combined influent from extraction well NHE-1 and two new extraction wells.

Alternative 4b is nearly identical to 4a, except for reinjection of treated water, rather than delivery to LADWP (and thus does not require the secondary VOC treatment system).

Alternatives 5a and 5b – Expand Extraction Well System and Operate *Ex Situ* Chromium Treatment System for All Extraction Wells

Alternatives 5a and 5b incorporate chromium treatment of influent from all the extraction wells, which would enable the NHOU system to achieve a hexavalent chromium concentration of less than 2 µg/L in the treated water leaving the plant. These alternatives were originally developed in anticipation of the State adopting a PHG for hexavalent chromium that might lead to an MCL significantly less than 5 µg/L. In August 2009, the State issued a proposed PHG of 0.02 µg/L, but it is too soon to know what the final PHG and eventual MCL might be.

Alternative 5a includes components common to all alternatives (see Section 2.9.1.1 and 2.9.1.2), with the following specific action:

- *Ex situ* treatment of chromium at the NHOU groundwater treatment facility for the combined influent from all of the extraction wells.

Alternative 5b is nearly identical to 5a, except for reinjection of treated water, rather than delivery to LADWP (and thus does not require the secondary VOC treatment system).

2.9.2 Common Elements and Distinguishing Features of Each Alternative

As noted in Section 2.9.1.1 and 2.9.1.2, several potential components of the Second Interim Remedy are shared by all of the remedial alternatives evaluated.

2.9.2.1 Applicable or Relevant and Appropriate Requirements

The following are the principal Applicable or Relevant and Appropriate Requirements (ARARs) that would apply to the proposed alternatives; more details for these and other ARARs are provided in Tables 7, 8, and 9:

- **Safe Drinking Water Act (SDWA).** Established MCLs for COCs in groundwater under the SDWA are: TCE (5 µg/L), PCE (5 µg/L), total chromium (100 µg/L), and vinyl chloride (2 µg/L).
- **State of California Domestic Water Quality and Monitoring Regulations.** Established MCLs for COCs in groundwater under the California Domestic Water Quality and Monitoring Regulations are: TCE (5 µg/L); PCE (5 µg/L); total chromium (50 µg/L); vinyl chloride (0.5 µg/L); and perchlorate (6 µg/L).
- **Clean Air Act.** The permit currently held by DWP for the VOC treatment system at NHOU requires 90 percent removal efficiency for TCE and PCE air emissions and a not-to-exceed level of 2 pounds per day of total VOCs. If the VOC treatment system is modified significantly as part of the selected remedy, then the substantive provisions of SCAQMD Rule 1401 (which limits air emissions of identified toxics from new or modified sources) would apply.
- **State of California Antidegradation Policy.** Prohibits the degradation of groundwater quality. This would apply to all the “b” alternatives (reinjection of treated groundwater) only.

In addition, the other criteria that EPA considered in setting performance standards for the proposed alternatives include:

- **CDPH Drinking Water Notification Levels.** The following notification levels may apply with respect to the off-Site delivery of water to the public: 0.005 µg/L for TCP, 3 µg/L for 1,4-dioxane, and 0.01 µg/L for NDMA.
- **California Public Health Goals (PHGs).** Developed by the Office of Environmental Health Hazard Assessment (OEHHA).

In the absence of MCLs, the state PHGs adopted by OEHHA have been considered during selection of performance standards for extracted groundwater. In the absence of both MCLs and PHGs, the drinking water notification levels established by CDPH have been considered during selection of performance standards for extracted groundwater.

No location-specific ARARs were identified for the Site during the 1987 ROD, and none have been identified for the alternatives presented in this FFS.

2.9.2.2 Distinguishing Features of Alternatives

As discussed above, the primary distinguishing features between the alternatives is the extent of the treatment for chromium, and the disposition of the treated water.

Alternative 1: The time required to implement Alternative 1 is negligible, as the primary treatment processes (the NHOU air stripper and vapor-phase granular activated carbon [VPGAC] unit) are already constructed and operating, and wellhead treatment at NHE-2 can be installed in 6 months or less. Under Alternative 1, approximately 420 million gallons of groundwater would be extracted and treated per year (assuming an 800 gpm average long-term pumping rate). Based on historical performance of the Existing NHOU Extraction and Treatment System, approximately 330 pounds (lbs) of VOCs (including TCE and PCE) would continue to be extracted and treated per year under Alternative 1. In addition, approximately 180 lbs of hexavalent chromium would be extracted and treated at well NHE-2 per year under Alternative 1.

Alternatives 2a and 2b: Repairs and modifications to the existing NHOU extraction wells, along with construction of new wells and treatment system components, would likely require 1 to 3 years. Approximately 1.6 billion gallons of groundwater would be extracted and treated per year, resulting in the projected removal of approximately 1,300 lbs of VOCs (including TCE and PCE) per year. In addition, approximately 380 lbs of hexavalent chromium are projected to be removed per year by the wellhead treatment systems at wells NHE-1 and NHE-2.

Alternatives 3a and 3b: Projected design and construction times, and removal rates for VOCs and hexavalent chromium under Alternatives 3a and 3b are identical to Alternatives 2a and 2b.

Alternatives 4a and 4b: Projected design and construction times, and removal rates for VOCs under Alternatives 4a and 4b are identical to Alternatives 2a through 3b, above. Approximately 540 lbs of hexavalent chromium are projected to be removed per year by the wellhead treatment system at well NHE-2 and the combined treatment system for three other extraction wells.

Alternatives 5a and 5b: Projected design and construction times, and removal rates for VOCs are identical to Alternatives 2a through 4b, above. Approximately 590 lbs of hexavalent chromium are projected to be removed per year by the combined chromium treatment system for all extraction wells.

Estimated Costs for Remedial Alternatives

A summary of the capital, annual O&M, and net present value (NPV) cost for each alternative is presented in Table 3. These cost estimates are based on a 7 percent discount rate and 30-year O&M period. Numerous assumptions have been made in estimating these costs. Details of the cost estimates for each alternative are provided in Appendix D of the FFS.

Table 3. Summary of Estimated Costs for Remedial Alternatives

Alternative	Capital Costs (\$)	Annual O&M Costs (\$)	Total Estimated NPV (\$)
1 – Existing Remedy w/LADWP delivery	12,000,000	2,300,000	40,100,000
2a – Expand Extraction Well System plus Cr wellhead Treatment at Wells NHE-1 & NHE-2 w/LADWP delivery	31,000,000	5,600,000	91,700,000
2b – Expand Extraction Well System plus Cr Wellhead Treatment at Wells NHE-1 & NHE-2 w/reinjection	60,300,000	5,400,000	118,100,000
3a – Expand Extraction Well System plus Cr Treatment for Combined Flow from Wells NHE-1 & NHE-2 w/LADWP delivery	29,900,000	5,000,000	82,600,000
3b – Expand Extraction Well System plus Cr Treatment for Combined Flow from Wells NHE-1 & NHE-2 w/reinjection	59,100,000	4,700,000	109,000,000
4a – Expand Extraction Well System plus <i>Ex Situ</i> Cr Treatment for Wells NHE-1 and -2 and NEW-2 and -3 w/LADWP delivery	36,900,000	6,400,000	107,800,000
4b – Expand Extraction Well System plus <i>Ex Situ</i> Cr Treatment for Wells NHE-1 and -2 and NEW-2 and -3 w/reinjection	66,100,000	6,200,000	134,200,000
5a – Expand Extraction Well System plus <i>Ex Situ</i> Cr Treatment for All Extraction Wells w/LADWP delivery	46,200,000	6,700,000	119,900,000
5b – Expand Extraction Well System plus <i>Ex Situ</i> Cr Treatment for All Extraction Wells w/reinjection	75,500,000	6,400,000	146,300,000

Notes: Capital costs and NPV have been rounded to the nearest \$100,000. Annual O&M costs have been rounded to the nearest \$1,000. NPV calculations assumed 30 years of O&M at 7% Discount Rate

2.9.3 Expected Outcomes of Each Alternative

As noted previously, the scope of the Second Interim Remedy does not include restoration of the aquifer. Furthermore, additional data are needed before EPA can determine what additional remedial actions, if any, are needed to address certain other areas of groundwater contamination. Therefore, none of the remedial alternatives considered are expected to result in unrestricted use of groundwater underlying the NHOU for drinking water, and timeframes for achieving aquifer restoration are not estimated.

Alternative 1

As a result of the diminished pumping rates and periodic shutdowns of extraction wells, a significant portion of the groundwater contaminated with VOCs exceeding the MCLs, as well as groundwater with high levels (greater than 50 µg/L) of VOCs, would not be hydraulically contained and would continue to migrate south and southeast under the regional gradient toward the BOU, GOU, and water-supply wells in the Erwin and Whitnall well fields. In addition, groundwater contaminated with chromium and 1,4-dioxane would likely migrate to the south and southeast from the vicinity of the former Bendix facility and well NHE-2 toward extraction wells

NHE-3 through NHE-5, potentially impacting their future operation. Under the expected future maximum pumping scenario for production wells in the vicinity of the NHOU, groundwater near the former Bendix facility with high concentrations of VOCs, chromium, and emerging contaminants is expected to migrate to LADWP's southern Rinaldi-Toluca water-supply wells, potentially limiting their future use.

Alternatives 2a through 3b

Some areas of VOC contamination (mostly where concentrations are less than 50 µg/L) will continue migrating toward the BOU and some LADWP production wells. Under Alternative 2a, the lack of chromium treatment for the new extraction wells that are expected to capture groundwater with high levels of chromium contamination could result in future shutdown or reduced pumping from those wells. Under Alternatives 2b and 3b, reinjection of treated water could increase the rate of groundwater “flushing” through the most contaminated part of the aquifer in NHOU, which could result in a modest increase in the rate of groundwater remediation. However, reinjecting the treated water would result in it becoming contaminated again following reinjection by mixing with existing groundwater contaminants in the aquifer.

Alternatives 4a and 4b

Alternatives 4a and 4b achieve similar outcomes as Alternatives 2a, 2b, 3a, and 3b with the primary difference being that Alternatives 4a and 4b will achieve greater removal of chromium from treated groundwater. Therefore, Alternatives 4a and 4b will provide enhanced protection of human health and an increased likelihood that the Second Interim Remedy will meet the RAOs in the long term (by including chromium treatment where chromium is likely to occur in groundwater at high concentrations).

Alternatives 5a and 5b

Alternatives 5a and 5b achieve similar outcomes as Alternatives 4a and 4b, but with increased costs, energy use, and production of treatment residuals.

2.10 Comparative Analysis of Alternatives

The NCP (40 CFR Section 300.430(e)(9)(iii)) describes the nine CERCLA criteria used to evaluate the alternatives under consideration. The comparative analysis provides the basis for determining which alternatives are most responsive to the criteria. The NCP categorizes the nine CERCLA evaluation criteria into three groups: (1) threshold criteria; (2) primary balancing criteria; and (3) modifying criteria. Each category of criteria has its own weight when applied to the evaluation of alternatives.

1. Threshold criteria are requirements that each alternative must meet to be eligible for selection as the preferred alternative. Threshold criteria include the overall protection of human health and the environment, and compliance with ARARs (unless a waiver is obtained).
2. Primary balancing criteria weigh the effectiveness and cost trade-offs among alternatives. Primary balancing criteria include long-term effectiveness and permanence; reduction of toxicity, mobility, or volume through treatment; short-term effectiveness; implementability;

and cost. The primary balancing criteria are the main technical criteria upon which the evaluation of alternatives is based.

3. Modifying criteria include state and community acceptance, which may be used to modify aspects of the selected alternative presented in the ROD.

A summary of the comparative analysis is presented in Table 4, below.

Table 4. Comparison of Remedial Alternatives

NCP Criteria	Alternative 1 Existing Remedy	Alternatives 2a and 2b Expand Extraction Well System plus Chromium Wellhead Treatment at Wells NHE-1 & NHE-2	Alternatives 3a and 3b Expand Extraction Well System plus Chromium Treatment for Combined Flow from Wells NHE-1 & NHE-2	Alternatives 4a and 4b Expand Extraction Well System plus <i>Ex Situ</i> Chromium Treatment for Wells NHE-1 and -2 and NEW-2 and -3	Alternatives 5a and 5b Expand Extraction Well System plus <i>Ex Situ</i> Chromium Treatment for All Extraction Wells
Threshold Criteria					
Overall Protection of Human Health and the Environment	Currently removes VOC contaminants in extracted groundwater to acceptable levels; however, does not provide adequate hydraulic containment of the most highly contaminated groundwater in the NHOU, nor does it provide double barrier protection for drinking water (the current beneficial use). Provides for chromium treatment only at well NHE-2.	Containment of the VOC plume is significantly improved compared to Alternative 1, including full containment of the high concentration areas. "Double barrier" protection from VOC contamination under Alternative 2a (delivery to LADWP). Provides for chromium treatment only at wells NHE-1 and NHE-2.	Similar level of protectiveness as Alternatives 2a and 2b.	Improved hydraulic containment compared to Alternative 1 (identical to Alternatives 2a through 3b); also includes chromium treatment for extraction wells NEW-2 and NEW-3.	Improved hydraulic containment compared to Alternative 1 (identical to Alternatives 2a through 4b); also includes chromium treatment for all extraction wells. However, chromium treatment is not expected to be required at all wells in order to meet the cleanup levels for either end use, and a larger quantity of treatment residuals would be produced by the chromium treatment system under Alternatives 5a and 5b.
Compliance with ARARs	Expected to comply with most ARARs. Treating only well NHE-2 for chromium may result in chromium concen- trations in the NHOU treated effluent exceeding the performance standard. Waiver required for cleanup of GW to MCLs.	Similar to Alternative 1, except 2b may require waiver from CA anti-degradation requirements.	Similar to Alternative 2a and 2b,	Expected to comply with the current MCLs and with most other ARARs. If reinjection is the end use of treated water, expected to comply with ARARs, including the State's anti-degradation policy. Waiver required for cleanup of GW to MCLs.	Similar to 4a and 4b.
Balancing Criteria					
Long-term Effectiveness and Permanence	Effective in removing contaminants from the water that it captures and treats, but its limited extraction system would allow VOC and	Improved extraction and treatment system will result in containment of the high concentration plumes and prevent further degradation of water quality in the vicinity	Identical long-term effectiveness and permanence as Alternatives 2a and 2b.	Chromium removal from new NHOU extraction wells NEW-2 and NEW-3 would provide an increased level of effectiveness and permanence compared to	Similar to Alternatives 4a and 4b, with the additional capability of treating chromium extracted from all NHOU extraction wells. However, chromium

Table 4. Comparison of Remedial Alternatives

NCP Criteria	Alternative 1 Existing Remedy	Alternatives 2a and 2b Expand Extraction Well System plus Chromium Wellhead Treatment at Wells NHE-1 & NHE-2	Alternatives 3a and 3b Expand Extraction Well System plus Chromium Treatment for Combined Flow from Wells NHE-1 & NHE-2	Alternatives 4a and 4b Expand Extraction Well System plus <i>Ex Situ</i> Chromium Treatment for Wells NHE-1 and -2 and NEW-2 and -3	Alternatives 5a and 5b Expand Extraction Well System plus <i>Ex Situ</i> Chromium Treatment for All Extraction Wells
	chromium contamination to migrate towards LADWP well fields and other NHOU extraction wells that lack chromium treatment.	of the LADWP well fields. However, reinjection of treated water under Alternative 2b would likely result in treated water becoming contaminated again following reinjection.		Alternatives 2a through 3b.	treatment is not presently required at all existing extraction wells, nor is it predicted to be needed in the future unless an MCL for hexavalent chromium is set at a level below 5 µg/L. Treatment of the combined discharge from all of the extraction wells under Alternatives 5a and 5b would require significantly more energy and result in production of greater volumes of treatment residuals than the other alternatives.
Reduction of Toxicity, Mobility, and Volume Through Treatment	Toxicity, mobility, and volume of contaminants in extracted groundwater will be permanently reduced by treatment. However, due to smaller groundwater extraction rates compared to the other alternatives, Alternative 1 will provide a lower degree of reduction of toxicity, mobility, and volume through treatment. Alternative 1 also provides less treatment for chromium in groundwater.	Will result in further reduction of the mobility and volume of VOCs and chromium in groundwater compared to Alternative 1, by increasing the volume of contaminated groundwater that is contained, extracted and treated in the NHOU. TCE, PCE, and other VOCs in groundwater will be removed with an expanded treatment system that traps VOCs and permanently destroys them at an off-Site carbon regeneration facility. Chromium will be removed from groundwater extracted by wells NHE-1 and NHE-2.	Identical reduction of toxicity, mobility, and volume of contaminants as Alternatives 2a and 2b.	Similar reduction of mobility of VOCs and chromium as Alternatives 2a through 3b. The combined chromium treatment system for extraction wells NHE-1, NEW-2, and NEW-3 would provide a greater degree of chromium mass removal from the extracted groundwater than Alternatives 2a through 3b, and also produce more treatment residuals.	Similar reduction of mobility of VOCs and chromium as Alternatives 2a through 4b. The combined chromium treatment system for all extraction wells would slightly increase chromium mass removal from the extracted groundwater than Alternatives 2a through 3b, and produce more treatment residuals.

Table 4. Comparison of Remedial Alternatives

NCP Criteria	Alternative 1 Existing Remedy	Alternatives 2a and 2b Expand Extraction Well System plus Chromium Wellhead Treatment at Wells NHE-1 & NHE-2	Alternatives 3a and 3b Expand Extraction Well System plus Chromium Treatment for Combined Flow from Wells NHE-1 & NHE-2	Alternatives 4a and 4b Expand Extraction Well System plus <i>Ex Situ</i> Chromium Treatment for Wells NHE-1 and -2 and NEW-2 and -3	Alternatives 5a and 5b Expand Extraction Well System plus <i>Ex Situ</i> Chromium Treatment for All Extraction Wells
Short-term Effectiveness	No substantial risks or environmental impacts would be posed to the community during the limited work involved in implementing this alternative.	No substantial risks or environmental impacts to the community or workers during construction or implementation of this alternative, beyond the general hazards associated with any construction project. Construction of new pipelines and wells may create a temporary nuisance to residents.	No substantial risks or environmental impacts (similar to Alternatives 2a and 2b). However, construction of an additional new pipeline from extraction well NHE-2 to the NHOU treatment plant Site may create an additional temporary nuisance to residents.	No substantial risks or environmental impacts (similar to Alternatives 2a and 2b). However, some nuisance to residents related to construction of new pipelines, wells, and a larger chromium treatment system.	No substantial risks or environmental impacts (similar to Alternatives 2a and 2b). However, some nuisance to residents related to construction of new pipelines, wells, and a larger chromium treatment system.
Implementability (technical)	Technically feasible to implement. No unusual technical difficulties are anticipated for design, construction, and operation of the additional extraction wells and more robust VOC treatment system. All the necessary services and materials are readily available.	Technically feasible to implement. Construction of the treatment system, injection wells, pipeline, and additional monitoring wells will add significantly to the time and effort required to implement Alternative 2b (reinjection).	Technically and administratively feasible to implement. Construction of the treatment system, injection wells, pipeline, and additional monitoring wells will add significantly to the time and effort required to implement Alternative 3b (reinjection).	Technically and administratively feasible to implement. Slightly more effort required to implement than Alternatives 2a through 3b (for design, construction, and operation of a chromium treatment system capable of handling the combined discharge from three extraction wells). Construction of the treatment system, injection wells, pipeline, and additional monitoring wells will add significantly to the time and effort required to implement Alternative 4b.	Alternatives 5a and 5b would require significantly more effort than Alternatives 4a and 4b for design, construction, and operation of a chromium treatment system capable of handling the combined discharge from all of the extraction wells.
Implementability (administrative)	Continued coordination would be required with the ULARA Watermaster and LAWDP to implement and maintain the ICs. The ability of Alternative 1 to achieve	Additional administrative issues (compared to Alternative 1) are anticipated regarding permitting and access requirements for the new extraction wells and pipelines, as well as	Identical administrative implementability issues as Alternatives 2a and 2b.	Additional administrative issues (compared to Alternative 1) are anticipated regarding permitting and access requirements for the new extraction wells and pipelines, as well as	Identical administrative issues as Alternatives 4a and 4b.

Table 4. Comparison of Remedial Alternatives

NCP Criteria		Alternative 1 Existing Remedy	Alternatives 2a and 2b Expand Extraction Well System plus Chromium Wellhead Treatment at Wells NHE-1 & NHE-2	Alternatives 3a and 3b Expand Extraction Well System plus Chromium Treatment for Combined Flow from Wells NHE-1 & NHE-2	Alternatives 4a and 4b Expand Extraction Well System plus <i>Ex Situ</i> Chromium Treatment for Wells NHE-1 and -2 and NEW-2 and -3	Alternatives 5a and 5b Expand Extraction Well System plus <i>Ex Situ</i> Chromium Treatment for All Extraction Wells
		cleanup levels for chromium in the combined effluent from the NHOU treatment system under the expected pumping scenarios is uncertain. Because of this uncertainty, LADWP and/or State agencies may not accept the current end use for the treated water under this alternative.	completing the permit application process for either end use option (LADWP delivery or reinjection). The ability of Alternatives 2a and 2b to achieve cleanup levels for chromium in the combined effluent from the NHOU treatment system under the expected pumping scenarios is uncertain. Because of this uncertainty, LADWP and/or State agencies may not accept either of the planned end use options for the treated water under these alternatives.		completing the permit application process for either end use option (LADWP delivery or reinjection). However, expanded chromium treatment should improve the acceptability of the treated water for the end use options.	
Costs						
Estimated Total Net Present Value (NPV), Including Capital and O&M Costs for 30 Years, Assuming a 7 Percent Discount Rate		\$40.1 million	Alternative 2a: \$91.7 million Alternative 2b: \$118.1 million	Alternative 3a: \$82.6 million Alternative 3b: \$109.0 million	Alternative 4a: \$107.8 million Alternative 4b: \$134.2 million	Alternative 5a: \$119.9 million Alternative 5b: \$146.3 million
Modifying Criteria						
State Acceptance	State agencies have indicated that Alternative 1 is not acceptable because of the continued migration of groundwater contamination and the potential for chromium contamination to migrate and further degrade the aquifer. The State has expressed its support for Alternative 4a, EPA's Preferred Alternative.					
Community Acceptance	LADWP has indicated that this alternative is not acceptable.	No comments were received on these alternatives			The PRPs do not support this alternative.	Preferred by LADWP and Representative Sherman. Not preferred by PRPs.

2.10.1 Overall Protection of Human Health and the Environment

This criterion addresses whether each alternative provides adequate protection of human health and the environment and describes how risks posed through each exposure pathway are eliminated, reduced, or controlled through treatment, engineering controls, and/or institutional controls.

Alternative 1 does not provide adequate hydraulic containment of the contaminated groundwater in the NHO, particularly the areas of highest contamination. Furthermore, although it is able to remove contaminants in extracted groundwater to currently acceptable levels, Alternative 1 does not provide double barrier protection for drinking water (the current beneficial use). Alternative 1 is considered to provide a relatively low level of protection of human health and the environment compared to Alternatives 2a through 5b.

Alternatives 2a through 5b would each achieve improved hydraulic containment of the groundwater exceeding the MCLs, including the most highly contaminated groundwater in the NHO. Under Alternatives 2a, 3a, 4a, and 5a (providing treated groundwater to LADWP's water supply system), double barrier treatment for VOCs provides an added level of safety towards ensuring that treated water meets all drinking water standards and requirements.

Under expected future production pumping scenarios, new extraction wells NEW-2 and NEW-3 are forecasted to intercept groundwater contaminated with high levels of chromium, which will result in exceedance of the MCL for chromium in the discharge from those wells. Only Alternatives 4a through 5b include chromium treatment for groundwater extracted by these two extraction wells. Alternatives 2a through 3b provide for chromium treatment only from extraction wells NHE-1 and NHE-2, and would therefore not result in achieving the MCL for chromium in the discharge from two of the new extraction wells. However, under Alternatives 2a, 3a, 4a and 5a, chromium concentrations in treated water would meet the identified Performance Standards (Table 6) Alternatives 5a and 5b provide the greatest degree of chromium treatment and would achieve the lowest levels of chromium in the treated water.

2.10.2 Compliance with ARARs

Section 121(d) of CERCLA and NCP § 300.430(f)(1)(ii)(B) require that remedial action at CERCLA Sites at least attain legally applicable or relevant and appropriate federal and state requirements, standards, criteria, and limitations which are collectively referred to as "ARARs", unless such ARARs are waived.

Applicable requirements are those cleanup standards, standards of control, and other substantive requirements, criteria, or limitations promulgated under federal environmental or state environmental or facility siting laws that specifically address a hazardous substance, pollutant, contaminant, remedial action, location, or other circumstance found at a CERCLA Site. Only those state standards that are identified by a state in a timely manner and that are more stringent than federal requirements may be applicable. Relevant and appropriate requirements are those cleanup standards, standards of control, and other substantive requirements, criteria, or limitations promulgated under federal environmental or state environmental or facility siting laws that, while not "applicable" to a hazardous substance, pollutant, contaminant, remedial action, location, or other circumstance at a CERCLA Site address problems or situations sufficiently similar to those encountered at the CERCLA Site that their use is well suited to the particular Site. Only those state standards that are identified in a timely manner and are more stringent than federal requirements may be relevant and appropriate.

The “Compliance with ARARs” criteria addresses whether an alternative will meet all of the identified ARARs or other federal and state environmental statutes or provides a basis for a invoking waiver.

All alternatives had common ARARs, with the exception that each of the end-use options (“a”s and “b”s) had different requirements. Other than noted below, each alternative is expected to comply with all federal and state ARARs to the same extent.

Under certain circumstances, Alternatives 2b and 3b may fail to comply with the State’s antidegradation policy ARAR because: (1) chromium concentrations could exceed the cleanup level in the NHOU treated effluent under certain pumping scenarios; or, (2) the current Honeywell effort to remediate hexavalent chromium in the vadose zone and aquifer in situ could be less effective than expected.

2.10.3 Long-Term Effectiveness and Permanence

This criterion assesses the extent to which each remedial alternative reduces risk after the remedial action objectives are met. Residual risk can result from exposure to untreated waste or treatment residuals. The magnitude of the risk depends on the quantity and concentration of the wastes and the adequacy and reliability of controls, if any, that are used to manage untreated waste and treatment residuals. For the alternatives described in this ROD, treatment residuals may include spent carbon, concentrated brines, or sludges.

Each alternative provides some degree of long-term protection. Alternative 1 would be effective in removing contaminants from the water that it captures and treats, but its limited extraction system would allow areas of high VOC and chromium contamination to migrate towards LADWP well fields, and the existing extraction system might allow hexavalent chromium to migrate to other NHOU extraction wells that lack chromium treatment.

Under Alternatives 2a through 5b, the improvements to the extraction and treatment system will result in containment of the high-concentration VOC and chromium plumes and prevent further degradation of water quality in the vicinity of the LADWP well fields. These alternatives will thus have a much higher degree of long-term protection than Alternative 1.

Alternatives 4a and 4b, which provide for chromium removal from two of the new NHOU extraction wells, would provide an increased level of effectiveness and permanence compared to Alternatives 2a through 3b. Alternatives 5a and 5b expand chromium treatment to include all of the existing and new NHOU extraction wells. However, chromium treatment is not presently required at all existing extraction wells, nor is it predicted to be needed in the future unless an MCL for hexavalent chromium is set at a level below 5 µg/L. Treatment of the combined discharge from all of the extraction wells under Alternatives 5a and 5b would require significantly more energy and result in production of greater volumes of treatment residuals than would be produced under Alternatives 2a through 4b.

2.10.4 Reduction of Toxicity, Mobility, or Volume Through Treatment

This criterion addresses the preference, as stated in the NCP, for selecting remedial actions employing treatment technologies that permanently and significantly reduce toxicity, mobility, or volume of the hazardous substances as a principal element of the action. This preference is satisfied when treatment is used to reduce the principal threats at a Site through destruction of toxic contaminants, reduction of total mass of toxic contaminants, irreversible reduction in contaminant mobility, or reduction of total volume of contaminated media.

All alternatives provide for reduction of toxicity, mobility, or volume through extraction of contaminated groundwater and treatment of VOCs at the NHOU treatment plant. TCE, PCE, and other VOCs in groundwater extracted from the NHOU will be removed with a treatment system that traps VOCs in granular activated carbon and then permanently destroys them at an off-Site carbon regeneration facility. The overall rate of groundwater extraction for Alternative 1 is significantly less than the rates for Alternatives 2a through 5b, and thus Alternative 1 will provide a lower degree of reduction of toxicity, mobility, and volume through treatment.

Under Alternatives 2a through 3b, chromium will be removed by wellhead treatment at extraction wells NHE-1 and NHE-2. The combined chromium treatment system for additional extraction wells included in Alternatives 4a through 5b would provide a greater degree of chromium mass removal from the extracted groundwater than Alternatives 2a through 3b.

2.10.5 Short-Term Effectiveness

This criterion evaluates the effects of each remedial alternative on human health and the environment during construction and operation, as well as the time required to meet the RAOs.

The modifications to the Existing NHOU Extraction and Treatment System included in Alternative 1 are minor, and do not pose substantial risks to the community or construction workers during implementation. No adverse environmental impacts are anticipated in the areas where facilities would be constructed.

Similar to Alternative 1, no special worker-protection issues or environmental impacts are anticipated under Alternatives 2a through 5b. Construction of pipelines from the new extraction wells to the NHOU treatment plant may create a temporary nuisance to residents but should not pose any significant risks. Similarly, under Alternatives 2b, 3b, 4b, and 5b, construction of the injection wells, additional pipelines, and additional monitoring wells may create an additional nuisance to residents but do not pose any substantial risks to the community or construction workers.

Alternatives 2a through 5b would take longer to implement (approximately 3 years) than Alternative 1, which is largely in place already. During that time, the existing NHOU treatment system would continue to be operated in such a manner that the contaminant concentrations in the treatment plant effluent remain below the MCLs and notification levels. Therefore, Alternatives 2a through 5b are expected to be as equally protective of human health in the short term as Alternative 1.

2.10.6 Implementability

This criterion addresses the technical and administrative feasibility of implementing an alternative and the availability of various services and materials required during its implementation.

All alternatives are considered to be technically feasible to implement, although implementation of Alternatives 2a through 5b will require substantially more effort than Alternative 1. Alternatives 5a and 5b are expected to be significantly more difficult to implement from a technical standpoint than Alternatives 2a through 4b, due to the relatively large chromium treatment system required.

As noted in the discussion of Compliance with ARARs, there is some uncertainty regarding the ability of Alternatives 1, 2a, 2b, 3a, and 3b to achieve performance standards for chromium in the combined effluent from the NHOU treatments system under the expected pumping scenarios. Because of this uncertainty, LADWP and/or the state agencies may choose not to accept the treated water for either of the planned end use options under these alternatives. Therefore, implementation of

Alternatives 1 – 3b is expected to be more difficult than Alternatives 4a and 4b from an administrative standpoint.

2.10.7 Cost

This criterion addresses the total cost of each alternative. This includes the capital costs (design, initial permitting, construction, startup, and contingencies), annual O&M costs (labor, materials, energy, laboratory analysis, and other services), and net present value (total cost in today's dollars for capital and O&M costs), assuming a discount rate of 7 percent and a period of operation of 30 years. The 30-year duration was chosen for cost estimating purposes only; a final ROD will be signed in the future that will comprehensively address the Site contamination. The cost estimates are considered order-of-magnitude level estimates, with an expected accuracy of +50 to -30 percent.

Alternative 1 is the lowest-cost alternative (see Table 5) over a 30-year period. Alternatives 2a and 3a, which are identical except for the individual versus combined chromium treatment units for extraction wells NHE-1 and NHE-2, are the next highest-cost alternatives. The difference between costs for these alternatives is within the range of uncertainty in the cost estimate, and should be considered approximately equal. Alternatives 4a and 5a have progressively higher costs, largely due to the higher flow volumes to be treated for chromium. Estimated costs for implementation of the reinjection option for end use of treated water (Alternatives 2b, 3b, 4b, and 5b), which includes construction of additional wells and pipelines, are substantially greater than the LADWP-delivery option (Alternatives 2a, 3a, 4a, and 5a).

2.10.8 State Acceptance

This criterion evaluates the technical and administrative issues and concerns the state may have regarding each alternative.

State agencies have indicated that Alternative 1 is not acceptable because of the continued migration of groundwater contamination and the potential for chromium contamination to migrate and further degrade the aquifer. The State has expressed its support for Alternative 4a, EPA's Preferred Alternative.

2.10.9 Community Acceptance

This criterion evaluates the issues and concerns the public may have regarding each alternative. EPA received comments on the Proposed Plan from nine parties. Seven of these parties were businesses, or parties acting on behalf of businesses or business property owners. These comments focused primarily on the need for more data before taking any action to select a new remedy, and on the lack of necessity for the extent of EPA's preferred alternative. One commenter proposed a sixth alternative. The others did not state a preference for alternatives.

EPA has addressed all of the significant comments received in the Responsiveness Summary section of this ROD. EPA does not believe that any of the issues raised in the comments warrants selection of a different interim remedy to address the groundwater contamination in the NHOU.

2.11 Principal Threat Wastes

The NCP establishes an expectation that EPA will use treatment to address the principal threats posed by a Site wherever practicable. The "principal threat" concept is applied to the characterization of "source materials" at a Superfund Site. A source material is material that includes or contains

hazardous substances, pollutants, or contaminants that act as a reservoir for migration of contamination to groundwater, surface water or air, or acts as a source for direct exposure. Contaminated groundwater generally is not considered to be a source material; however, non-aqueous phase liquids (NAPLs) in groundwater may be viewed as source material. Because the NHOH is a groundwater-only Site and NAPL has not been detected in groundwater in the NHOH, principal threat wastes are not considered present for this ROD.

2.12 Selected Remedy

EPA's selected Second Interim Remedy for the NHOH is Alternative 4a, which includes: the construction of new extraction wells; the modification/rehabilitation of several existing extraction wells; expanded VOC treatment; chromium treatment for NHE-1, NHE-2 and two of the new extraction wells; installation of additional monitoring wells; institutional controls; and, use of the treated water in LADWP's water supply system.

2.12.1 Summary of the Rationale for the Second Interim Remedy

Based on the information currently available, EPA believes the Second Interim Remedy meets the threshold criteria and provides the best balance of trade-offs when compared to the other alternatives. The installation of additional extraction wells, the modification of existing extraction wells, and expansion of the VOC treatment system will significantly improve plume capture and prevent further degradation of water quality at the Rinaldi-Toluca and North Hollywood West well fields. This alternative will also result in permanent and significant reduction in the mobility and volume of VOCs in groundwater in the NHOH. The addition of chromium treatment for four of the extraction wells will insure that the remedy meets all requirements for use of the treated water in LADWP's water supply system, and it will also significantly reduce the possibility that extraction wells would have to shut down or be throttled back as a result of increases in chromium concentrations. Delivery of treated water to LADWP provides the greatest beneficial use of the treated water and at a significantly lower cost than reinjection.

No comments were received from residents in the area of the NHOH. The comments from PRPs expressed their belief that the Selected Interim Remedy is not necessary. LADWP prefers alternative 5a because of its flexibility to adapt to possible future changes in aquifer conditions and/or drinking water standards. The State has concurred with EPA's Selected Interim Remedy.

2.12.2 Description of the Second Interim Remedy

The following is a description of the Second Interim Remedy; Figure 7 schematically illustrates the major components. Although the EPA does not expect significant changes to this remedy, there may be some level of modification during the remedial design and construction processes. Any changes to the remedy described in this ROD would be adopted and documented as appropriate and consistent with the applicable regulations.

Institutional Controls (ICs)

Governmental controls in place in the SFV act as effective institutional controls to prevent the public's exposure to contaminated groundwater. The primary governmental control is the 1979 Final Judgment in the Superior Court of California, County of Los Angeles, (Superior Court Case No. 650079) in the case titled The City of Los Angeles vs. City of San Fernando, et al. The final

judgment created the entity known as “Watermaster” with full authority to administer the adjudication of water rights, under the auspices of the Superior Court.

Under the final judgment, only the cities of Los Angeles, Burbank, and Glendale are permitted to extract groundwater from the Basin. Each of these municipalities administers a public drinking water system, which is regulated and subject to permits issued by the CDPH. These drinking water regulatory controls and the Watermaster’s authority to regulate and allocate water resources ensure centralized control over area groundwater and its use as a drinking water source.

However, certain groundwater pumping scenarios acceptable to the Watermaster could interfere with the effectiveness of the Second Interim Remedy. In order to address this issue, an additional IC is necessary, wherein EPA and LADWP work together to develop and implement a groundwater management plan that would protect the effectiveness and integrity of the NHOU remedy while being consistent with LADWP’s drinking water production requirements. The groundwater resources management program is expected to provide for regular sharing of relevant groundwater data and pumping rate projections, planning for groundwater use, and a decision-making process to address any potential conflicts between the LADWP’s pumping plans and the performance of the remedy. To ensure that the groundwater management plan and the implementation mechanisms for that plan are an effective IC, EPA intends for it to be defined in a formal agreement between EPA and LADWP.

Groundwater and Treatment System Monitoring

Approximately 37 new monitoring wells will be installed; proposed locations are identified on Figure 9. Of these, Honeywell has already installed approximately 25 of these wells, in coordination with, and with oversight by, the EPA.

Monitoring of groundwater levels and groundwater quality from the new monitoring wells included in the Second Interim Remedy and selected existing wells will allow for evaluation of contaminant plume migration and the effectiveness of the selected remedial actions. The specific monitoring objectives that were used to develop a modified groundwater monitoring network as part of the Second Interim Remedy include the following:

- Fill key data gaps to adequately characterize the lateral and vertical extent of contaminant plumes and known hotspot areas and their relationship to known source areas;
- Provide information to monitor the progress of the remedy and to detect the migration of known COCs and emerging chemicals from known plume and hot spot areas; and,
- Develop the data necessary for evaluating and, as necessary, selecting future additional response actions for areas of the VOC plume that may not be captured by the Second Interim Remedy.

Under all alternatives, groundwater monitoring within the NHOU is expected to include continued sampling and analysis of the new and existing EPA monitoring wells in the NHOU, selected facility monitoring wells, LADWP production wells, and extraction wells in the North Hollywood area for VOCs, chromium, emerging chemicals, and parameters indicative of geochemical conditions that may affect chromium speciation and transport.

It is assumed that the future sampling regimen for the new and existing monitoring wells would be similar to the ongoing SFV Basin-wide sampling program, and would include:

- Monthly sampling at the extraction wells and quarterly or annual sampling at the selected monitoring and production wells for VOCs, hexavalent chromium, 1,4-dioxane, and TCP.

- Annual sampling of the extraction wells, selected monitoring wells, and selected production wells for dissolved metals (including total chromium), NDMA, perchlorate, nitrate, common anions, alkalinity, and total dissolved solids.

Depending on the analytical results for groundwater samples collected from the new monitoring wells, construction of additional monitoring wells may be required to further delineate contaminant plumes or determine the locations for continuing sources of groundwater contamination. After the first year of sampling results for all new wells have been evaluated, the frequency and analyte list for the monitoring program may be modified to optimize the efficiency and effectiveness of the NHOU monitoring program.

Wellhead 1,4-dioxane Treatment at Extraction Well NHE-2

Wellhead treatment for 1,4-dioxane will occur at well NHE-2, where concentrations ranging from 4 to 9 µg/L have been detected since 2006 (the CDPH notification level for 1,4-dioxane is 3 µg/L). The treatment technology to be applied is the ultraviolet light and hydrogen-peroxide AOP because it provides the most flexibility for future process modifications; however, during design, another treatment option may be selected. Even though Honeywell is currently under order with the RWQCB to install 1,4-dioxane treatment at NHE-2, EPA has determined that it is also a necessary component of the Second Interim Remedy and is selecting it in this ROD.

The 30-year O&M period for treatment of VOCs at the NHOU is assumed to also apply to wellhead 1,4-dioxane treatment at NHE-2. The estimated O&M duration will be re-evaluated if 1,4-dioxane concentrations change significantly during this period.

Replace Existing Extraction Well NHE-1

To achieve the required hydraulic containment under the Second Interim Remedy, replacement of existing extraction well NHE-1 with a deeper well of similar construction will be necessary. The target screened interval for a replacement for well NHE-1 is from 190 to 401 feet; however, the screened interval may be adjusted during the remedial design phase, depending on results of future groundwater level and quality data.

Replace or Repair and Modify Existing Extraction Wells NHE-2, NHE-4, and NHE-5

Replacement of wells NHE-2, NHE-4, and NHE-5 with deeper wells of similar construction will likely be necessary to achieve the required hydraulic containment under the Second Interim Remedy. Target screened intervals for these wells under Alternatives 2a through 5b are as follows:

- NHE-2: 190 to 390 feet bgs
- NHE-4: 180 to 400 feet bgs
- NHE-5: 180 to 415 feet bgs

Similar to extraction well NHE-1, the screened intervals for these wells may be adjusted during the remedial design phase. Alternatively, the existing wells could remain active in their present configuration, and wells with deeper screened intervals could be constructed adjacent to each existing well. These paired (deeper) wells would also be connected to the existing NHOU treatment plant. The pumping rates at each extraction well pair could be adjusted, depending on the depth to the water table, to maximize containment of the most contaminated aquifer zone, typically Depth Region 1.

Rehabilitate Existing Extraction Wells NHE-3, NHE-6, NHE-7, and NHE-8

Extraction wells NHE-3, NHE-6, NHE-7, and NHE-8 are screened at appropriate depths for plume containment and have been able to pump at or near their design pumping rates for most of the operational history of the NHOU treatment system. They are not expected to require replacement or modification at present. However, routine repair or replacement of pumps and ancillary equipment will be required as part of an ongoing O&M program to maintain design pumping rates. To ensure optimal long-term performance of these wells, it is assumed they will be rehabilitated using swabbing, surging, sand bailing, and over-pumping techniques. Additional rehabilitation efforts (e.g., acid-flushing or jetting) will also be considered on a case-by-case basis, depending on results of the initial rehabilitation efforts.

Construct New Extraction Wells

Preliminary computer modeling conducted during the FFS concluded that three new extraction wells are necessary to further limit contaminant migration and to improve contaminant mass removal. A new pipeline will be required to connect the new extraction wells to the NHOU treatment plant. The exact number, location, and pumping rates for these wells are estimated and will be finalized during remedial design. Based on computer modeling conducted as part of the FFS, these new wells (New Northwestern Wells) should be located northwest of the existing NHOU treatment system in locations (see Figure 8) selected to prevent VOC and chromium migration towards the Rinaldi-Toluca well field and the western portion of the North Hollywood well field. The modeling also suggested that each of the New Northwestern Wells should pump at a maximum rate of 420 gpm (350 gpm long-term average) in order to achieve the containment objective. Screened intervals for these wells are expected to be approximately 220 to 420 feet bgs, but actual intervals, as well as the number and location of the new extraction wells, may be revised during the remedial design phase. Pumping rates and schedules for these wells should be optimized periodically during implementation of the Second Interim Remedy to achieve the desired capture zones, in consideration of pumping rates and drawdown resulting from the southern production wells in the Rinaldi-Toluca well field. Pumping rates for the three New Northwestern Wells will be evaluated and modified, if necessary, to maximize effectiveness and efficiency of the Second Interim Remedy. Depending on groundwater conditions (e.g., hydraulic gradients) in the NHOU, which can change on a seasonal to annual basis, it may be beneficial to temporarily reduce or stop pumping from these wells periodically. A plan for optimizing pumping rates of the NHOU extraction wells will be developed as part of the remedial design process.

Treatment of VOCs in Extracted Groundwater

Expansion of VOC treatment capacity at the NHOU will be necessary to treat the volume of groundwater produced by the existing NHOU extraction wells and the proposed additional extraction wells. The existing NHOU treatment plant will be augmented to accommodate peak and average pumping rates of 3,600 and 3,050 gpm respectively, and for peak VOC concentrations up to 650 µg/L of TCE and 100 µg/L of PCE. The existing air stripper will be refurbished and a second air stripper, similar in capacity to the original, will be installed and operated in parallel with the existing system. The combined maximum capacity of the two parallel air strippers will be 4,800 gpm or more at the anticipated influent VOC concentrations, allowing expansion of the extraction well network or pumping rates in the future, if necessary. With air stripping as the primary VOC treatment process, the VOC treatment train should include the following major components:

- The air stream exiting the air stripper contains TCE and PCE and must be treated using vapor-phase granular activated carbon (VPGAC) vessels (or an alternative technology) to remove the TCE and PCE before the air is discharged to the atmosphere.
- Untreated influent, treated effluent, and air exiting the air stripper at the NHOH treatment plant must be monitored to ensure compliance with permit requirements, ARARs, and LADWP policies.
- A secondary VOC treatment system (such as LPGAC) is required downstream from the air strippers to meet the “double barrier” VOC treatment requirement of CDPH for discharge into a drinking water source. LPGAC would have the additional benefit of also removing VOCs that are not readily removed by the air stripping process, most notably TCP. TCP is not currently detected in the influent to the Existing NHOH Extraction and Treatment System, but has been detected in groundwater within the NHOH at concentrations exceeding the notification level of 0.005 µg/L.

Wellhead Chromium Treatment at Well NHE-2

Ex situ treatment of chromium will be required at well NHE-2. In the FFS, ferrous iron reduction with microfiltration was identified as the preferred technology for a wellhead treatment system (and used for the costing). Alternatively, an anion-exchange-based treatment process could be installed, if pilot test results expected from the GOU in 2010 demonstrate that the process is effective and does not produce excessive NDMA or other problematic organic compounds.

Ferrous iron reduction decreases total chromium concentrations by chemically reducing hexavalent chromium to trivalent chromium and co-precipitating the trivalent chromium with ferric iron. The ferric iron and trivalent chromium co-precipitate is flocculated and removed using a conventional clarifier and media filter polishing or a microfilter. The key components of a ferrous iron reduction and filtration system include a series of reactors for ferrous iron reduction of hexavalent chromium to trivalent chromium. A microfilter system coupled with a backwash system then removes the ferric iron and trivalent chromium precipitate (solids). A batch-thickening and dewatering system receives the resulting solids sludge. The residual sludge is expected to be disposed at an approved off-Site facility, either a RCRA-facility, or perhaps a reclamation facility.

Anion exchange decreases total chromium concentrations by exchanging hexavalent chromium oxyanions for chloride anions using a bed of selective ion exchange resins. The ion exchange resin is regenerated off-Site by a vendor service. The major components of an anion exchange system for the NHOH plant would be three ion exchange adsorber vessels and a backwash system. The backwash system removes broken resin beads and trace suspended solids, and it recovers backwash water. Disposal of backwash solids as a wet sludge is assumed. Similar to the ferrous-iron reduction system for chromium treatment, an anion-exchange system could be scaled up or down in capacity to accommodate a changing number of extraction wells or concentrations requiring treatment.

A peak pumping rate of 300 gpm (250 gpm average long-term flow rate) was assumed in the FFS for chromium treatment at NHE-2. It is assumed the peak chromium concentration in the influent to the wellhead treatment system would be 600 µg/L (1.5 times the current concentration at NHE-2), and would require treatment to 5 µg/L or less. The 30-year O&M period for treatment of VOCs at the NHOH is assumed to also apply to wellhead chromium treatment at NHE-2. The estimated O&M duration will be reevaluated if chromium concentrations change significantly.

EPA is selecting the wellhead chromium treatment described above as part of the Second Interim Remedy despite the fact that Honeywell is currently under CAO with the RWQCB to install a treatment system at NHE-2 for chromium. Honeywell's chromium treatment system is not expected to be of sufficient capacity for the increased pumping rate that is expected from NHE-2 and EPA anticipates that Honeywell's system will either have to be expanded, or a new system installed.

Ex Situ Chromium Treatment for Wells NHE-1, NEW-2, and NEW-3

Ex situ treatment of chromium using the ferrous iron reduction with microfiltration process described above was assumed to be implemented in the FFS for the combined flow from three extraction wells at the NHOU groundwater treatment facility (see previous section for details of this treatment method). It is assumed that this system would be sized to treat the combined influent from extraction well NHE-1 and new extraction wells NEW-2 and NEW-3 (a peak combined pumping rate of 1,100 gpm). Alternatively, an anion-exchange-based treatment process could be installed, similar to the above. A 30-year O&M period for treatment of VOCs at the NHOU is assumed to also apply to *ex situ* chromium treatment.

Delivery of Treated Groundwater to LADWP

The treated groundwater will be used by LADWP as part of their municipal supply (following blending with other water sources and further water treatment). Use of the NHOU treated water in LADWP's drinking water supply requires compliance with federal and state drinking water standards, including the San Fernando Basin Water Management Plan's *Policy Guidance for Direct Domestic Use of Extremely Impaired Sources*, CDPH Policy Memorandum 97-005 ("97-005"), which establishes a specific process for the evaluation of impaired water sources before they can be approved for use as drinking water.

Off-Site Requirements: All CDPH and LADWP treatment levels or standards, including those identified through the 97-005 process, that apply to COCs must be met by the Second Interim Remedy in order to deliver the NHOU treated water to LADWP for use in its domestic water supply. Because these treatment levels and standards are off-Site drinking water requirements, they are not ARARs. However, they must be met in order to comply with the Second Interim Remedy's end use, and therefore, are incorporated into this ROD as enforceable standards. Because they are not ARARs, offsite requirements that change over time must be met in order to comply with the Second Interim Remedy's selected end use. Currently, the concentrations of the NDMA, TCP, perchlorate, and 1,4-dioxane in the NHOU groundwater are sufficiently low that treatment is only needed for 1,4-dioxane at NHE-2. If, during the design process, concentrations are found to be increasing at any of the extraction wells, such that the cleanup level is exceeded at the compliance point, additional well-head treatment may be necessary.

2.12.3 Summary of the Estimated Remedy Costs

A summary of the estimated capital, O&M, and present worth costs of the major components of the Second Interim Remedy is included in Table 5. A detailed breakdown of these costs is provided in Appendix D of the FFS. The information in this cost estimate summary table is based on the best available information regarding the anticipated scope of the remedial alternative. Changes in the cost elements are likely to occur as a result of new information and data collected during the engineering design of the Second Interim Remedy. Major changes, if they were to occur, would be adopted and documented as appropriate. As is the practice at federal Superfund Sites, these cost estimates are based on an expected accuracy range of -30 to +50 percent of actual costs.

Table 5. Cost Estimate Summary for the Second Interim Remedy

	Component	Notes and Assumptions	Capital Cost^a	Annual O&M Cost^b	Net Present Value^c
1	Groundwater monitoring	Install 37 new monitoring wells and periodically sample existing and planned monitoring wells, production wells, and extraction wells (includes quality assurance/quality control samples)	\$6,980,000	\$758,000	\$16,379,200
2	Groundwater extraction from existing NHOU extraction wells	Deepen 4 existing extraction wells, rehabilitate 4 existing extraction wells, and operate all 8 extraction wells at design pumping rates (2,000 gpm combined average flow, 2,400 gpm peak)	\$2,740,000	\$527,000	\$9,274,800
3	Groundwater extraction from new extraction wells	Install 3 new extraction wells and new pipeline to NHOU treatment plant, operate new extraction wells (1,050 gpm combined average flow, 1,200 gpm peak)	\$3,770,000	\$213,000	\$6,411,200
4	Primary VOC treatment (air-stripping)	Construct and operate second air stripper, and use existing air stripper at design rate (includes refurbishment at year 15)	\$1,908,140	\$599,000	\$9,335,740
5	Secondary VOC treatment (LPGAC)	Construct and operate two new LPGAC treatment units in parallel downstream from air strippers (redundant VOC treatment)	\$2,870,000	\$576,000	\$10,012,400
6	Interim wellhead treatment for 1,4-dioxane and chromium at extraction well NHE-2	Performed prior to completion of Second Interim Remedy; operate at 190 gpm for 3 years	\$4,130,000	\$790,000	\$6,199,800
7	Expand wellhead treatment for chromium at extraction well NHE-2	Expand interim wellhead treatment system for chromium at NHE-2 (to 250 gpm average flow, 300 gpm peak) following construction of Second Interim Remedy, operate for 30 years	\$3,650,000	\$861,000	\$14,326,400
8	Chromium treatment for combined flow from NHE-1 and two new extraction wells	Single treatment unit designed for 950 gpm average flow, 1,100 gpm peak	\$9,410,000	\$1,691,000	\$30,378,400
9	Expand wellhead treatment for 1,4-dioxane at extraction well NHE-2	Expand interim wellhead treatment system for 1,4-dioxane at NHE-2 (to 250 gpm average flow, 300 gpm peak) following completion of Second Interim Remedy, operate for 30 years	\$640,000	\$428,000	\$4,708,080
10	CDPH 97-005 process	Required to use treated water from NHOU as part of LADWP's water-supply	\$750,000	\$0	\$750,000
TOTALS:			\$36,848,140	\$6,443,000	\$107,776,020

Notes:

^a Capital cost estimates are not discounted because the construction work will be performed in the first year.

^b O&M costs include labor and expenses for repairs, energy for operation, and other costs that accrue on a continuous or periodic basis during an average year of system operation.

^c Net present value estimates assume a 7% discount rate on annual O&M costs for a 30-year period for all remedial components.

Costs for monitoring the treatment system performance are included in each alternative above.

2.12.4 Expected Outcomes of the Second Interim Remedy

Improvements to the existing NHOU extraction wells and construction of new extraction wells will result in improved hydraulic containment under the expected future pumping scenarios for water supply in the eastern SFV. The goal of the remedy is to improve hydraulic containment and to control migration of the contaminated plume in excess of MCL's. The Selected Interim Remedy will prevent

groundwater with the highest contaminant concentrations from migrating to the nearby Rinaldi-Toluca and North Hollywood West production wells and areas of the aquifer with significantly lower contaminant concentrations. As a result, water-supply wells screened in areas or depth intervals of the aquifer that contain small or no detectable concentrations of the COCs are expected to continue operating without further restrictions caused by increasing contaminant levels.

Because the Second Interim Remedy is for containment and not restoration, no final cleanup standards have been established for restoration of groundwater. This means that at least a portion of the shallow and deep zones upgradient of the compliance wells and any associated extraction systems will likely remain contaminated and unusable for a considerable length of time.

2.12.5 Applicable or Relevant and Appropriate Requirements

The Selected Interim Remedy is expected to comply with all federal and state ARARs except for 40 CFR § 300.430(e)(2)(i)(A), which requires that the contaminant levels of the groundwater that remains in the aquifer be reduced below MCLs. Because this is an interim action for containment of groundwater contamination, EPA has not established chemical-specific ARARs for restoration of groundwater remaining on-Site. EPA is waiving this ARAR pursuant to CERCLA Section 121(d)(4)(A), 42 U.S.C. § 9621(d)(4)(A), and 40 CFR § 300.430(f)(1)(ii)(C), which allows EPA to select a remedy that does not achieve an ARAR when the remedial alternative selected is an interim measure that will become part of a total remedial action that will attain ARARs. EPA's waiver of the aquifer cleanup standard does not apply to water extracted from the aquifer and delivered to LADWP for use as drinking water; all extracted and treated water is expected to comply with MCL ARARs.

2.13 Statutory Determinations

Under CERCLA Section 121, EPA must select remedies that are protective of human health and the environment, comply with ARARs (unless a statutory waiver is justified), consider the reasonableness of cost for the selected remedy, and utilize permanent solutions and alternative treatment technologies or resource recovery technologies to the maximum extent practicable. In addition, CERCLA includes a preference for remedies that employ, as a principal element, treatment that permanently and significantly reduces the volume, toxicity, or mobility of hazardous wastes and a bias against off-Site disposal of untreated wastes. The following sections discuss how the Second Interim Remedy meets these statutory requirements.

2.13.1 Protection of Human Health and the Environment

Exposure to contaminated groundwater through the potable water supply is the area of potential human-health risk in the NHOU. There are no potentially complete exposure pathways for contaminated groundwater to reach ecological receptors.

The Second Interim Remedy will protect human health and the environment by achieving hydraulic containment, to the extent practicable, of groundwater exceeding the MCLs, including the most significant areas of groundwater contamination in the NHOU and thereby preventing the highest contaminant concentrations from migrating to the nearby Rinaldi-Toluca and North Hollywood West production wells. The Selected Interim Remedy's double-barrier VOC treatment components will remove the VOCs that the existing NHOU treatment system was designed to remove, and other treatment components will remove emerging contaminants of potential concern (including hexavalent chromium and 1,4-dioxane) to the performance standards identified in this ROD. Water supply wells,

NHOU extraction wells, EPA (RI) monitoring wells, and facility monitoring wells will be monitored and access to contaminated groundwater will be restricted through institutional controls.

The remedy will not have detrimental cross-media impacts. The groundwater treatment system will comply with air quality requirements. Treated groundwater will be conveyed directly to LADWP's closed distribution system. There are no short-term threats associated with the Second Interim Remedy that cannot be readily controlled.

2.13.2 Compliance with Applicable or Relevant and Appropriate Requirements

The Second Interim Remedy shall comply with ARARs as described below. A complete list of all ARARs for the Second Interim Remedy is provided in Tables 7 and 8, below. Table 9 summarizes To-Be-Considered (TBC) criteria. Because this is an interim action for the containment of groundwater contamination, EPA has not established chemical-specific ARARs for restoration of groundwater.

40 CFR § 300.430(e)(2)(i)(A) requires that the contaminant levels of the groundwater that remains in the aquifer are reduced below MCLs. EPA is waiving this ARAR pursuant to CERCLA Section 121(d)(4)(A), 42 U.S.C. § 9621(d)(4)(A), and 40 CFR § 300.430(f)(1)(ii)(C), which allows EPA to select a remedy that does not achieve an ARAR when the remedial alternative selected is an interim measure that will become part of a total remedial action that will attain ARARs. EPA's waiver of the aquifer cleanup standard does not apply to water extracted from the aquifer and delivered to LADWP for use as drinking water or re-injected; all extracted and treated water is expected to comply with MCL ARARs.

Performance Standards for treated groundwater are summarized in Table 6. The current regulatory standards for TCE, PCE, and the other VOC COCs are the state and federal MCLs. The current regulatory standard for total chromium is the state MCL of 50 µg/L. As of September 2009, there is no MCL for hexavalent chromium. However, LADWP has indicated that it will not accept water for use in its drinking water supply system with hexavalent chromium levels exceeding 5 ug/L. Therefore, EPA has chosen to use LADWP's 5 ug/L voluntary limit as a performance standard in the remedy. If a new MCL for hexavalent chromium is adopted a higher degree of chromium treatment may be required in order to ensure that the treated water continues to meet requirements for drinking water.

No state or federal MCLs have been promulgated for TCP, 1,4-dioxane, or NDMA. For these emerging chemicals that lack MCLs, EPA is treating the CDPH notification levels, which are health-based advisory levels for drinking water use, as criteria to be considered in setting alternative performance standards for extracted groundwater in the NHOU. Notification levels are established as precautionary measures for contaminants that may be considered candidates for establishment of MCLs.

For the purposes of determining compliance with the performance standards presented in Table 6, the point of compliance shall be the combined effluent from the NHOU treatment facility, just prior to its delivery to the end use, the LADWP drinking water system.

The ARARs are frozen at the time the ROD is signed, but off-site requirements, including requirements applicable to treated water delivered to the drinking water supply, must be met in order to comply with the Second Interim Remedy's selected end use regardless of whether those requirements change over time. As a result, if an offsite drinking water requirement changes, the

treatment system must meet whichever standard - the performance standard selected in the ROD or the offsite requirement - is lower.

Table 6. Performance Standards for COCs in Extracted and Treated Groundwater

Contaminant of Concern	Federal MCL (µg/L)	California MCL (µg/L)	CDPH Notification Level (µg/L)	Basis for Performance Standard	Performance Standard (µg/L) ^a
TCE	5	5	None	Federal MCL	5
PCE	5	5	None	Federal MCL	5
1,1-DCA	5	5	None	Federal MCL	5
1,2-DCA	0.5	0.5	None	Federal MCL	0.5
1,1-DCE	6	6	None	Federal MCL	6
cis-1,2-DCE	6	6	None	Federal MCL	6
1,1,2-TCA	5	5	None	Federal MCL	5
Carbon tetrachloride	0.5	0.5	None	Federal MCL	0.5
Methylene Chloride	5	5	None	Federal MCL	5
Total Chromium	100	50	None	California MCL	50
Hexavalent Chromium	None ^b	None ^{b,c}	None	See footnote "d"	5 ^d
Perchlorate	None	6	None	California MCL	6
TCP	None	None	0.005	CDPH notification level	0.005
1,4-dioxane	None	None	3	CDPH notification level	3
NDMA	None	None	0.01	CDPH notification level	0.01

Notes:

^aThe CDPH permitting process may require lower concentrations in the treated effluent.

^bFederal and state MCLs specific to hexavalent chromium have not been established; therefore, the state MCL for total chromium currently is applied to hexavalent chromium.

^cA PHG for hexavalent chromium is currently under development by OEHHA. Following development of a PHG, a state MCL specific to hexavalent chromium may be established.

^dBased on discussions with LADWP, it is EPA's understanding that LADWP will continue to use a voluntary cleanup level of 5 µg/L for hexavalent chromium for water it will accept for use in its water supply system. Consequently, under the drinking water end use option, chromium treatment at the NHOU will be needed so that LADWP's voluntary cleanup level of 5 µg/L can be met.

Table 7. Chemical-specific Applicable or Relevant and Appropriate Requirements

Source	Citation	Applicable or Relevant and Appropriate	Description	Findings and Comments
SDWA (2 USC 300 et seq.)	National Primary Drinking Water Standards, including 40 CFR 141.61 and 40 CFR 141.62	Relevant and appropriate	Chemical-specific drinking water standards and MCLs have been promulgated under the SDWA; MCLGs above zero are considered chemical-specific ARARs under the NCP (40 CFR 300.430(e)(2)(i)(B)). When the MCLGs are equal to zero, which is generally the case for a chemical considered to be a carcinogen, the MCL is considered the chemical-specific ARAR instead of the MCLG (40 CFR 300.430(e)(2)(i)(C)). Established MCLs for COCs are listed in Table 3-4 of the FFS. Performance Standards for the SFV treated effluent were established in the 1987 ROD at 5 µg/L for TCE and 4 µg/L for PCE. However, the MCL and performance standard for PCE has since been changed to 5 µg/L. The MCL of 5 ug/L for TCE and PCE will apply to the effluent from the treatment plant. Performance Standards for groundwater in the aquifer are not established at this time in any of the alternatives.	The MCLs are ARARs for the purpose of establishing Performance Standards for the treated water from the NHOU treatment plant. 40 CFR 300.430(e)(2)(i)(B) and 40 CFR 300.430(e)(2)(i)(C) require that the remedy selected attain non-zero MCLGs or MCLs for each contaminant if the groundwater is a current or potential drinking water source.
SDWA (42 USC 300 et seq.)	National Primary Drinking Water Standards, including 40 CFR 141, including 40 CFR 141.23 and 40 CFR 141.24	Relevant and appropriate	Requires monitoring to determine compliance with MCLs.	Substantive monitoring requirements in 40 CFR 141.23 and 40 CFR 141.24 are relevant and appropriate, to ensure that treated effluent is meeting performance standards.
State of California Domestic Water Quality and Monitoring Regulations	California Safe Drinking Water Regulations, including 22 CCR 64431 and 22 CCR 64444	Relevant and appropriate	Contains provision for California domestic water quality; establishes MCLs for primary drinking water chemicals.	The MCLs are ARARs for the purpose of establishing performance standards for COCs in the water extracted from the basin and treated at the treatment plant.

Notes:

CCR = California Code of Regulations
MCLG = maximum contaminant level goal
SDWA = Safe Drinking Water Act

Table 8. Action-Specific Applicable or Relevant And Appropriate Requirements

Source	Citation	Applicable or Relevant and Appropriate	Description	Findings and Comments
Clean Air Act SCAQMD	Air Pollution Control Equipment Permit 144890 was granted August 29, 1986.	Substantive requirements of the permit are applicable	In California, the authority for enforcing the standards established under the Clean Air Act has been delegated to the state. The program is administered by the SCAQMD in Los Angeles. Permit 144890 (held by LADWP) requires 90 percent removal efficiency for TCE and PCE air emissions and a not-to-exceed level of 2 pounds per day of total VOCs.	<p>The existing system includes use of air stripping technology to remove VOCs from the groundwater. Emissions from the air stripper must meet SCAQMD limits and the other substantive provisions established in this permit.</p> <p>Although a permit is not required for the air stripper pursuant to CERCLA § 121(d), LADWP obtained a permit in advance of construction in 1986. According to SCAQMD, the permit from the SCAQMD remains valid, and the emission limits and other substantive requirements in it are applicable.</p> <p>If the air stripping treatment system is modified significantly as part of the selected remedy, the substantive provisions of SCAQMD Rule 1401 (which limits air emissions of identified toxics from new or modified sources) may apply.</p>
California Water Code and State Water Resources Control Board Model Well Standards Ordinance (1989)	Division 7, Chapter 10, Section 13700 et seq.	Applicable	The California Water Code requires the State Water Resources Control Board to adopt a model well ordinance implementing the standards for well construction, maintenance, and abandonment contained in the construction requirements for wells, in conformance with DWR Bulletin 74-81. DWR Bulletin 74-90 updates DWR Bulletin 74-81.	If the selected alternative involves well construction or maintenance, substantive provisions of this code will be applicable.

Table 8. Action-Specific Applicable or Relevant And Appropriate Requirements

Source	Citation	Applicable or Relevant and Appropriate	Description	Findings and Comments
California Hazardous Waste Regulations, Generator Requirements	22 CCR 66262.10	Applicable	22 CCR 66262.10 lists the sections of California law with which a generator of hazardous waste must comply.	<p>The selected remedy need only comply with the substantive provisions of the regulations listed in 22 CCR 66262.10.</p> <p>Each alternative considered in the FFS has the potential to generate hazardous waste. Examples of hazardous wastes generated on-Site include: (1) spent granular activated carbon filters from the air stripper, (2) purged water from new or modified wells that meets characteristic waste levels, and (3) well casing soils from new or modified wells that meet characteristic waste levels.</p>
California Hazardous Waste Regulations, Generator Requirements	22 CCR 66262.11	Applicable	Requires waste generators to determine if wastes are hazardous, and establishes procedures for such determinations.	The substantive requirements will be applicable to management of waste materials generated by a groundwater treatment plant and to any waste generated while installing new wells.
California Hazardous Waste Regulations, Generator Requirements	22 CCR 66262.34(a)(1)(A)	Relevant and appropriate	Waste stored on-Site should be placed in containers or tanks that are in compliance with California Hazardous Waste Regulations.	Storage of hazardous waste accumulated on-Site must be in compliance with substantive requirements for interim status facilities.
California Hazardous Waste Regulations, Storage of Hazardous Waste	22 CCR 66265.170 et seq. (Article 9) 22 CCR 66265.190 et seq. (Article 10)	Applicable	Regulates use and management of containers, compatibility of wastes with containers, and special requirements for certain wastes.	Substantive provisions of Articles 9 and 10 will be applicable if hazardous waste is generated and accumulated on-Site.
California Land Disposal Restrictions, Requirements for Generators	22 CCR 66268.3, 22 CCR 66268.7, 22 CCR 66268.9, and 22 CCR 66268.50	Applicable	Compliance with land disposal regulation treatment standards is required if hazardous waste (e.g., contaminated soil) is placed on land. Soil treatability variance may be invoked, according to 40 CFR 268.44 (h)(3) and (4).	Hazardous waste hauled off-Site must meet "land-ban" requirements.

Table 8. Action-Specific Applicable or Relevant And Appropriate Requirements

Source	Citation	Applicable or Relevant and Appropriate	Description	Findings and Comments
California Land Disposal Restrictions, Requirements for Generators	22 CCR 66268.1 et seq. (Article 1)	Applicable	Prior to transporting for off-Site disposal, hazardous waste must be characterized to determine whether land disposal restriction treatment standards apply and whether the waste meets the treatment standards. This information must be provided to the off-Site facility with the first waste shipment.	The substantive requirements will be applicable to management of waste materials generated by a groundwater treatment plant and to any waste generated while installing new wells.
Spent Carbon Disposal	40 CFR 268.40	Applicable	Attain land disposal treatment standards before putting waste into landfill to comply with land disposal restriction.	Substantive requirements apply.

Notes:

NPDES = National Pollutant Discharge Elimination System
 SCAQMD = South Coast Air Quality Management District
 DWR = Department of Water Resources
 CFR = Code of Federal Regulations
 CCR = California Code of Regulations
 RWQCB = Regional Water Quality Control Board

Table 9. To-Be-Considered Criteria

Source	Citation	Description	Findings and Comments
California PHGs, California Environmental Protection Agency, and OEHHA	California Calderon-Sher SDWA of 1996, California Health and Safety Code 116365	OEHHA has adopted PHGs for chemicals in drinking water. PHGs are levels of drinking water contaminants at or below which adverse health effects are not expected to occur from a lifetime of exposure.	In the absence of MCLs, the state PHGs adopted by OEHHA have been considered during selection of performance standards for extracted groundwater.
CDPH Drinking Water Notification Levels	California Health & Safety Code § 116455	CDPH has established drinking water notification levels (formerly known as action levels) based on health effects, but in some cases they are based on organoleptic (taste and odor) values for chemicals without MCLs.	In the absence of MCLs, the drinking water notification levels established by CDPH have been considered during selection of performance standards for extracted groundwater.

No location-specific ARARs were identified for the Site during the 1987 ROD, and none have been identified for the Second Interim Remedy.

This interim remedial action shall comply with all ARARs described in this section. Because this is an interim action for containment of groundwater contamination, EPA has not established chemical-specific ARARs for restoration of groundwater remaining on-Site. These ARARs will be addressed in the Final ROD for the NHOU.

2.13.3 Cost-Effectiveness

In EPA's judgment, the Second Interim Remedy is cost-effective and represents a reasonable value for the money to be spent. Section 300.430(f)(ii)(D) of the NCP requires EPA to evaluate the cost of an alternative relative to its overall effectiveness. This was accomplished by evaluating "overall effectiveness" of those alternatives that satisfied the threshold criteria (i.e., Alternatives 2a through 5b, which are protective of human health and comply with all selected ARARs). Overall effectiveness was evaluated by assessing four of the five balancing criteria in combination (long-term effectiveness and permanence; reduction in toxicity, mobility, and volume through treatment; short-term effectiveness; and implementability). Overall effectiveness was then compared to costs to determine cost-effectiveness. The relationship of the overall effectiveness of this remedial alternative was determined to be proportional to its costs and hence this alternative represents a reasonable value for the money spent.

The estimated net present value of the Second Interim Remedy (Alternative 4a) is \$108 million. Although Alternatives 2a and 3a were \$16 million to \$26 million less expensive, respectively, expected chromium migration to the new extraction wells was not addressed. EPA believes that the Second Interim Remedy's additional cost for expanded chromium treatment provides a significant increase in protection of human health and the environment, and increased likelihood that the remedy will remain in compliance with ARARs during its anticipated period of operation.

2.13.4 Utilization of Permanent Solutions and Alternative Treatment Technologies to the Maximum Extent Practicable

EPA has determined that the Second Interim Remedy represents the maximum extent to which permanent solutions and treatment technologies can be utilized in a practicable manner at the NHOU, until EPA obtains sufficient data to select a final remedy. EPA has also determined that the Second Interim Remedy provides the best balance of tradeoffs in terms of the five balancing criteria, while also considering the statutory preference for treatment as a principal element and bias against off-Site treatment and disposal, as outlined below:

- Long-term Effectiveness and Permanence: By controlling (to the extent practicable) migration of the groundwater exceeding MCLs, including the most highly contaminated groundwater in the NHOU, the area for potential future residual contamination in groundwater and the vadose zone is limited.
- Reduction of Toxicity, Mobility, or Volume Through Treatment: Improved hydraulic containment and expanded groundwater treatment will reduce the mobility and volume of dissolved-phase VOC and emerging contaminant concentrations in groundwater, result in the permanent destruction of VOCs and 1,4-dioxane, and reduce the toxicity of chromium by converting it from the hexavalent to the trivalent form.
- Short-term Effectiveness: There are no special short-term effectiveness issues that set the Second Interim Remedy apart from the other alternatives evaluated.
- Implementability: The Second Interim Remedy is not significantly more complex to implement than the other remedial alternatives.

2.13.5 Preference for Treatment as a Principal Element

The Second Interim Remedy will treat VOCs, chromium, and other emerging contaminants in the extracted groundwater to achieve the cleanup levels. By utilizing treatment as a significant portion of the remedy, the statutory preference for remedies that employ treatment as a principal element is satisfied.

2.13.6 Five-Year Review Requirements

Because this remedy will result in hazardous substances, pollutants, or contaminants remaining on-Site above levels that allow for unlimited use and unrestricted exposure, a statutory review will be conducted within five years after initiation of remedial action to ensure that the remedy is, or will be, protective of human health and the environment.

Part 3

Responsiveness Summary

Part 3 – Responsiveness Summary

The purpose of this Responsiveness Summary is to provide a summary of EPA's responses to comments received from stakeholders and the public on EPA's Proposed Plan for the North Hollywood Operable Unit (NHOU) Second Interim Remedy. During the Public Meeting (held on July 21, 2009), EPA provided verbal clarifications to questions about the NHOU Proposed Plan. The proceedings of the Public Meeting were transcribed by a court reporter and are included in the Administrative Record.

During the public comment period, EPA received nine letters from stakeholders with comments on the Proposed Plan. EPA is required to consider and address only those comments that are pertinent and significant to the remedial action being selected. EPA is not required to address comments which pertain to the allocation of liability for the remedial action, nor potential enforcement actions to implement the remedial action, as these are independent of the selection of the remedial action and EPA's Proposed Plan. EPA does have the discretion to address comments with limited pertinence if doing so would address the concern of a significant segment of the public.

A summary of the major issues raised by commenters is presented in the next section. Additional detail on the specific technical comments can be found in Appendix A.

FFS Errata

During EPA's review of the documents relied upon for this decision, an error was discovered in the summary-cost calculation in the *North Hollywood Operable Unit (NHOU) Focused Feasibility Study* (FFS) cost summary table D-1. This error led to incorrect capital and operations/maintenance (O&M) costs being tabulated in the FFS and Proposed Plan (PP). The 30-yr net present value (NPV) costs are all correct in the FFS and PP, and the more detailed cost table in the FFS (Table D-2) correctly lists the capital and O&M costs for each alternative.

The miscalculation consisted of double-counting some capital and O&M costs, but the NPV costs for each alternative were calculated separately (from the detailed cost summary in Table D-2), and therefore did not include the double-counting error. Therefore, where capital and O&M costs are summarized in the FFS and PP, they are about 35% higher than actual estimated costs. Following are the specific locations where the capital and O&M cost summaries listed in the FFS and PP are miscalculated:

- FFS: Table 5-2, Table D-1 (Appendix D), and Sections 5.2.1.7, 5.2.2.7, 5.2.3.7, 5.2.4.7, and 5.2.5.7
- PP: Table 3

Replacement tables and pages have been placed in the Administrative Record for this action.

3.1 Stakeholder Issues

EPA received limited community response regarding the FFS and Proposed Plan provided to EPA during the public comment period, but numerous stakeholder submitted comments. Most of these comments were submitted by potentially responsible parties (PRPs) or on behalf of the PRPs.

LADWP and Congressman Sherman also submitted comments expressing their preference for Alternative 5a, rather than EPA's Preferred Alternative (Alternative 4a). The primary difference between Alternatives 4a and 5a is that Alternative 4a includes chromium treatment only for the four extraction wells expected to be impacted by the highest concentrations of chromium, whereas Alternative 5a includes chromium treatment for the combined flow from all of the existing and new extraction wells, regardless of the chromium concentration detected at individual extraction wells.

3.2 Technical and Legal Issues

Several PRPs commented that insufficient groundwater data were available to adequately evaluate remedial alternatives in the FFS or select a Preferred Remedy in the Proposed Plan. EPA's review of available data indicates that although data gaps existed in some areas of NHOU, sufficient data were available to achieve the objectives of the FFS and prepare a Proposed Plan for the Second Interim Remedy. The next step, remedial design of the remedy identified in the ROD, will require that key data gaps be filled. Additional groundwater data are currently being collected in the NHOU, which will be incorporated into the remedial design process.

Some PRPs expressed concern that deepening existing extraction wells and installing new extraction wells could cause cross-contamination of different depth intervals of the aquifer underlying the NHOU. In response to this concern, EPA will require that during the remedial design stage specific drilling methods, well locations, and well depths will be selected to mitigate the possibility of cross contamination.

Some PRPs felt that new extraction wells were not necessary. However, modeling performed as part of the FFS indicates that under the maximum pumping scenario for water supply anticipated by LADWP, the capture zones for the Rinaldi-Toluca and North Hollywood (West Branch) water supply well fields are predicted to include groundwater in the vicinity of NHE-1 and NHE-2 with high concentrations of VOC and chromium contamination. The three proposed new extraction wells in the vicinity of NHE-1 are intended to intercept contaminated groundwater migrating toward these water supply well fields under the maximum pumping scenario, and to significantly expand contaminant plume capture under the average pumping scenario. Specific pumping rates, locations and pumping schedules for these wells will be further evaluated during remedial design to maximize their effectiveness and optimize their efficiency.

Use of a performance standard of 5 µg/L for hexavalent chromium was questioned by some PRPs. Although 5 ug/L is not an ARAR, the Selected Interim Remedy must meet this performance standard in order to deliver the treated water to LADWP (the selected end use), for use in its drinking water supply.

Appendix A

Detailed Response to Technical Comments

The following is EPA's more detailed response to the comments received on the proposed plan. The NCP requires EPA to summarize significant comments, criticisms, and relevant information submitted during the public comment period and to respond to each significant issue raised. Although EPA is not required to re-print the public comments verbatim, in many cases in this response summary EPA has included large segments of the original comments. Persons wishing to see the full text of all comments should refer to the commenters' submittals to EPA, which are included in the Administrative Record.

Specific comments (and responses by EPA) are numbered for convenient reference. The comments are numbered sequentially through the Response Summary, without reference to the specific commenter. Comments are shown in normal text, and EPA responses are shown in italics.

1. FFS and PP fail to meet standard for FS; lacks important data; fails to consider appropriate alternatives.

Response: EPA believes that the Focused Feasibility Study (FFS), which is intended to focus on a limited number of critical issues for the development of an interim ROD, fully satisfies the requirements for such documents. Until a final remedy is developed for the Site, the goal of the interim remedy selected in this ROD is to contain plume migration, reduce contaminant mass, and address the emerging contaminants that currently pose a risk. The alternatives evaluated in the FFS are targeted to those goals.

2. EPA lacks sufficient GW data to Support the PP; The GW model is subject to significant uncertainty on the local scale and needs to be regarded with caution

Response: The groundwater model was calibrated to 25 years of available head data in the vicinity of NHOU. While uncertainty is always a concern with groundwater modeling forecasts, the version of the San Fernando Valley model that was used for the FFS is adequate to illustrate the significant differences in forecasted containment between the remedial alternatives, and to evaluate effectiveness of each alternative in capturing both the source areas and more distal portions of the contaminant plumes.

3. EPA must gather more environmental data before adopting a deficient FFS.

Response: The objective of the FFS was to: (1) identify, evaluate, and compare alternatives for plume containment, reduction of contaminant mass, and treatment of emerging contaminants that currently pose a risk; and, (2) identify a preferred alternative to present in the Proposed Plan. Although data gaps existed in some areas of NHOU, sufficient data were available to achieve the objective of the FFS. The next step, remedial design of the remedy identified in the ROD, will require that key data gaps be filled. Additional groundwater data are currently being collected in the NHOU and will be incorporated into the remedial design.

4. Drilling deeper wells and installing new wells will cause cross contamination and alter the existing contaminant plume

Response: During the remedial design phase, specific drilling methods, well locations, and well depths will be selected to mitigate the possibility of cross contamination. One of the goals of the Second Interim Remedy is to “alter the existing contaminant plume” in a way that will improve capture and prevent further contamination of water-supply wells in the North Hollywood area.

5. EPA should consider the benefits of Alternative 5a as a means of adopting the most flexible and expansive remediation plan.

Response: Although this would certainly be the most flexible in terms of potential long-term goals, it is not the alternative that best meets the nine criteria evaluation. Currently, there is no need for the additional treatment capacity specified in alternative 5a, and there is no certainty that there will be such a need in the future. Should the state ultimately promulgate an MCL for chromium that is lower than 5 µg/L, the remedy can be re-evaluated at that time, and changed if necessary to accommodate that revised standard. At this point, there is no added benefit of the additional treatment included in Alternative 5a.

6. Based on the anticipated concentrations of the potential byproducts created during the chromium treatment process, relative to any regulatory level, there is no need for BAC and no need for coagulation and filtration

Response: The most important design requirement of the Second Interim Remedy is to be protective of human health. During development of the remedial alternatives presented in the FFS, treatment components required to meet expected process conditions were included. As noted in the comment, byproducts are formed in the advanced-oxidation process (AOP) for 1,4-dioxane, particularly partially oxidized organic carbon compounds such as aldehydes, ketones, carboxylic acids, and keto acids), and the effluent concentration of the partially oxidized byproducts cannot be precisely predicted. The oxidation treatment will partly or completely oxidize the target chemicals of concern (COCs), as well as other naturally occurring organic materials (also called naturally occurring carbon [NOC]). The NOC has not been characterized and the byproducts of the COCs or the NOC cannot be precisely predicted. During the remedial design phase, Site-specific bench-scale or pilot-scale tests with the selected oxidation technology can be conducted. Based on the results of those tests, the need for biologically activated carbon (BAC) can be evaluated. If BAC is included, coagulation and filtration, as well as disinfection, are required by CDPH.

7. The Summary of Estimated Costs may underestimate and unevenly weigh the costs for the different remedial alternatives because EPA uses too high a discount rate.

Response: The federal Office of Management and Budget has set forth guidelines on acceptable discount rates to be used, which EPA has adopted. That rate is 7%, which was applied in the FFS.

8. The proposed installation of three extraction wells in the vicinity of NHE-1 is not supported by the current data.

Response: Under the maximum pumping scenario for water supply anticipated by LADWP, the Rinaldi-Toluca and North Hollywood (West Branch) water supply well fields are forecasted to withdraw contaminated groundwater from the western area of the VOC plume in Depth Regions 1 and 2 (within the 50 µg/L contours), and potentially from the chromium plume, as described in the FFS. The three proposed new extraction wells in the vicinity of NHE-1 are forecasted to intercept contaminated groundwater migrating toward these water supply well fields under the maximum pumping scenario, and to significantly expand contaminant plume capture under the average pumping scenario. Specific pumping rates and pumping schedules for these wells will be further evaluated during remedial design to maximize their effectiveness and optimize their efficiency.

9. Containment areas were based on data collected between 2003- 2007. Current data should be included in the analysis where possible.

Response: Use of current data only to define target volumes for plume containment in NHOU would not adequately delineate areas where high concentrations of contaminants are expected in the future. Contaminant concentrations have fluctuated by one to two orders of magnitude over periods of several years at monitoring, extraction, and production wells in the NHOU. This is partly due to horizontal migration of contaminant plumes, and partly due to contaminant mass remaining in the vadose zone above the water table, which has been remobilized when groundwater levels increased in the past 5 years. Therefore, contaminant concentrations in groundwater are likely to increase substantially in the future at wells where high concentrations were detected in the recent past.

In addition, the Focused Feasibility Study was begun in 2008, and so the most current, fully available, data was used in the development of the model. It is not anticipated that the more recent data would substantially change the decision. The most up-to-date data will be used in during the design process, to refine the proposed remedy.

10. The FFS appears to be considering two different GW remediation strategies simultaneously: removal of existing VOCs from the overall GW plume and removal of emerging contaminants in specific locations.

Response: The EPA is required to address contamination that exists in the groundwater, and this includes all the contaminants. There is no separate “strategy”, and the removal of all contaminants to levels that do not pose a human health threat is the goal of addressing both VOCs and emerging contaminants.

11. There were several questions relating to the end point of this remedy, the choice of it being an “interim” remedy, and how long it will take to complete the remedy.

Response: As is indicated, this is an interim remedy, and the final remedy will be proposed and selected at a future date. The EPA believes that there are still some significant data gaps which prohibit the selection of a final remedy at this time. The

end point of the remediation will be when the cleanup has met the objectives specified in the final remedy.

12. Have the mitigation aspects of “natural attenuation” been considered as a part of the “leave in place” treatment option for VOCs?

Response: The focus of the Second Interim Remedy is containment of the VOC plume exceeding MCLs, including the highest-concentration VOC, chromium, and emerging contaminant plumes in groundwater in the immediate vicinity of the Existing NHOU Extraction and Treatment System. Natural attenuation would not be expected to significantly affect concentrations of VOCs or emerging contaminants over the relatively short distances considered for containment in the Proposed Plan. One of the objectives of the additional data collection described in the Proposed Plan is to improve delineation of groundwater contamination beyond the immediate vicinity of the Existing NHOU Extraction and Treatment System to determine whether additional remedial actions are necessary. Natural attenuation would be considered when making such a determination in the future, following collection of the additional data.

13. Has *in situ* biological remediation been considered for the existing VOC concentrations?

Response: The FFS focused on technologies for plume containment as a first priority, and also evaluated technologies and alternatives for reduction of contaminant mass, and treatment of emerging contaminants that currently pose a risk. The FFS did not include in situ bioremediation of the VOC plumes as one of the technologies due to the large plume areas, significant depth to groundwater, diffuse nature of the VOC plumes, and the need for rapid containment. In situ bioremediation is not a viable remedial option under such conditions due to its high cost, incomplete effectiveness, and the time required for remediation to acceptable levels. In situ treatment methods, possibly including bioremediation, can be effective at small, highly concentrated source areas, and may be considered as part of a final remedy for NHOU.

14. To deepen the wells to 425 feet will draw down contamination deeper into the aquifer; The FFS alternative 4 plan will result in the horizontal and vertical spreading of the plume contamination.

Response: During the remedial design phase, specific drilling methods, well locations, and well depths will be selected to mitigate the potential for cross contamination. Groundwater modeling results presented in the FFS indicate that Alternatives 4a and 4b will improve hydraulic containment and limit spreading of contamination. Further evaluation of specific pumping rates and extraction well locations will be performed during remedial design to ensure that implementation of the Second Interim Remedy will not cause additional degradation of the aquifer.

15. FFS alternative 4 does not address other wellfields besides Rinaldi – Toluca.

Response: Alternative 4a (the preferred alternative in the FFS and Proposed Plan) addresses contamination currently impacting, or expected to impact, the North Hollywood (East and West Branches), Whitnall, and Erwin well fields, in the same manner as the Rinaldi-Toluca well field. The improved containment of highly contaminated groundwater in the vicinity of the existing NHOU extraction and

treatment system, as well as the additional investigation planned in the NHOU, are expected to reduce impacts to these well fields or provide sufficient data to plan future remedial measures, if necessary, to protect these well fields.

16. EPA's FFS does not take into account the natural chrome already in existence at the NHOU.

Response: The target volumes described in the FFS for containment of chromium contamination include areas and depths where chromium concentrations exceed naturally occurring concentrations in the vicinity of the NHOU. Chromium concentrations detected in monitoring wells located upgradient from known areas of anthropogenic chromium contamination are typically less than 5 µg/L in Depth Region 1, and are generally less than 1 µg/L where detected in Depth Regions 2, 3, and 4. The remedial alternatives presented in the FFS do not target chromium treatment for areas of the aquifer where concentrations of chromium are lower than these levels, nor is the performance standard less than background levels.

17. The number of wells needed and the rationale for these wells has not been established.

Response: The number of extraction wells to be installed was estimated based on the results of modeling that was performed over the last several years and considered a range of pumping and recharge scenarios. The number of wells, their location and pumping rates will be refined during the remedial design process. The rationale is to meet the RAOs as presented in the FFS.

18. How does alternative 4 assist LADWP in producing more water from the San Fernando Valley?

Response: This is not the goal of the remedy. The goal of this remedy is to meet the RAOs specified in this ROD. However, one of the RAOs is to prevent further degradation of water quality at the Rinaldi-Toluca and North Hollywood West production fields, and the Second Interim Remedy achieves this RAO by improving the capture and containment of groundwater contamination in excess of MCLs through the installation of the new extraction wells.

19. How does alternative 4 comply with LADWP 97.005 regulations [sic]?

Response: The alternative itself cannot "comply", but in order for the treated water to be utilized by LADWP in its drinking water (the selected end use), the process set forth by the CA Department of Public Health (not the LADWP), and delineated in their 97.005 policy, will need to be implemented.

20. The costs for the proposed remedy are not broken down sufficiently despite its being 85 pages long.

Response: Estimated costs for all significant components for each remedial alternative, including the Second Interim Remedy, are detailed in Appendix D of the FFS, which is available in the Administrative Record. The level of detail provided is consistent with EPA policy and guidance regarding cost estimates developed in a feasibility study.

21. The FFS gives alternative 1a, a meets criteria best grade for compliance with applicable or relevant and appropriate requirements and short term effectiveness. Based on the flaws and costs of alternative 4a and 4b, how does EPA justify not employing 1a?

Response: The EPA chose the remedy that best met all the nine criteria, not simply the one that best met the two criteria cited. This is a complex Site, with complex hydrogeological conditions; there is no remedy that is not without limitations, but Alternative 4a was chosen as the remedy that best meets the objectives and RAOs.

22. The TCE/PCE 5 µg/l concentration contour is inaccurately placed with regard to Penrose Well MW-4927. Figure 2-2 (of the FFS) shows the well to be within the 5 µg/l contour line when the concentration shown on the figure indicates that the concentration is 1.8 µg/l PCE. Figure 2-2 should be revised to reflect these data.

Response: EPA concurs that well 4927 incorrectly appears inside the 5 µg/L TCE/PCE contour. This contour should have been placed approximately 1/10th of an inch to the left on this figure, representing a real shift of approximately 200 feet to the west. However, this minor graphical issue does not affect the analysis or results of the FFS, Proposed Plan, or ROD. In future versions of this map, the contour will be adjusted appropriately.

23. The plume drawings for the extent of the contamination are not supported by the number of sampling points and are only a “best guess” estimation by the computer program used to draw the plume maps.

As shown on Figure 2-2, Hewitt monitoring wells 4909F and 4909C are very close to one another. However, the contours drawn to the north, northeast, west and south are based on only two data points more than 2,000 and 3,000 feet away.

The 1,4-dioxane concentration line on Figure 2-8 for the Landfills is shown as a long, narrow, elongated rectangle which never occurs in the natural environment. This concentration line cannot be supported by the data, is not technically defensible and should be removed from the figure.

A disclaimer should be added to the figures stating that the plumes are computer generated and may not reflect the actual extent of TCE/PCE concentrations in the subsurface.

Response: The FFS figures referenced in the comment portray maximum concentrations detected from January 2003 through December 2007, and were drawn for the purpose of developing target volumes for remediation, not to map the geometry of contaminant plumes in the NHOU at any particular period, current or past. The concentration contours in the areas of concern noted in the comment are dashed on the figures. These dashed lines represent areas where the contour lines are approximate. Improved delineation of contaminant plumes in the NHOU is a goal of this ROD.

Regarding the “narrow, elongated” 5 µg/L concentration contour for 1,4-dioxane shown on Figure 2-8, EPA disagrees with the statement that such a geometry “never occurs in the natural environment.” In areas of relatively high groundwater velocity (where the hydraulic gradient or hydraulic conductivity of the aquifer is high), long

and narrow contaminant plumes are common, especially where laterally constrained by less permeable materials, as in this situation.

24. EPA's "Double Barrier" for treatment of VOCs is not needed. Since the existing air stripper system delivers water with satisfactory VOC concentrations to the LADWP, it is not necessary to treat all the pumped ground water a second time by passing treated water through granular activated charcoal (the so-called "double barrier"). EPA's Alternatives 2, 3, 4 and 5 all contemplate adding additional air strippers to improve the removal of VOCs. EPA's proposal to add further treatment by liquid-phase granular activated charcoal is redundant and very expensive. The "double barrier" for treatment is not identified as an ARAR in the discussion of ARARs in the FFS.

Response: The added treatment is a requirement of the CDPH for the use of extremely impaired water as a source of water supply. The "Double Barrier" treatment is an "off-Site" requirement, and therefore, not an ARAR, but it is a requirement that must be met in order to comply with the end use for the Second Interim Remedy, which is delivery of treated water to LADWP for domestic use.

25. The 5 µg/l Target for Chromium is Not an ARAR. Page ES-9 of the Executive Summary states "For this FFS, a target concentration for capture and treatment of hexavalent and total chromium of 5 µg/l is assumed in anticipation of the issuance of a significantly lower state MCL for hexavalent chromium." An MCL that might be issued someday and then again might not be issued does not have the status of an Applicable or Relevant and Appropriate Requirement under CERCLA. Given the difference in toxicity of trivalent and hexavalent chromium, the FFS provides inadequate justification for targeting ground water with a total chromium concentration of 5 µg/l as if it was all hexavalent chromium. Even if the MCL for hexavalent chromium actually was 5 µg/l, adopting as a goal the containment of the ground water plume using a target concentration of 5 µg/l for total chromium would likely result in an overestimate of the volume of ground water requiring treatment. An overestimate of the volume of contaminated ground water directly affects EPA's estimate of the cost of remedial alternatives since a significant fraction of the cost, such as that for LPGAC treatment, is proportional to the amount of contaminated ground water to be treated.

Response: EPA agrees that the 5 µg/l target for hexavalent chromium is not an ARAR; it is, however, required in order for the end use selected as part of this remedy, which is provision of the treated water to the LA DWP to be used in its drinking water.

Most of the dissolved chromium detected in groundwater in the NHOU is present in the more toxic hexavalent state (chromium-6), rather than the trivalent state (chromium-3). Therefore, most of the total chromium detected in groundwater samples consists of hexavalent chromium. Regarding volumes of groundwater targeted for extraction and treatment, the FFS notes that the volume of groundwater within the NHOU that is contaminated with VOCs is significantly greater than the volume contaminated with hexavalent chromium. The chromium target volumes (5 and 50 µg/L) are mostly encompassed by the 50 µg/L VOC contour. Therefore, treatment volumes and associated costs are controlled by the VOC plume dimensions, not the chromium (either total or hexavalent) plume dimensions.

26. One commenter suggested an alternative approach for the Second Interim Remedy, which it claims reduces the risk of exacerbating contaminant plume migration while improving plume containment where data are sufficient to support such actions. Under the commenters proposed alternative, EPA would move forward with the following elements of the Proposed Plan:

- Remediation of chromium at NHE-2, with consideration of treating NHE-2 water with equipment located at the former Bendix facility to achieve better efficiency and cost savings;
- Improving groundwater containment in the area of NHE-4 and NHE-5, either through the installation of new wells or the rehabilitation of NHE-4 and NHE-5 in a manner that minimizes downward contaminant migration;
- Refurbishment of the existing air stripper and the addition of carbon polishing (granular activated carbon or "GAC") at the NHOU Central Treatment Facility; and,
- Implementation of source control under RWQCB oversight and orders.

An analysis would be made of the following elements of EPA's Proposed Plan after more data has been collected to substantiate whether these measures will be effective in remediating the aquifer for drinking water purposes:

- Installation of three NEW pumping wells and deepening of NHE-1, which are not technically justified based on available data, and which may exacerbate contaminant plume migration;
- Deepening of NHE-2, as investigation at the former Bendix facility indicated that NHE-2 is of sufficient depth to capture the high concentration contaminant mass;
- Deployment of remediation for 1,4-dioxane at NHE-2, which requires further information to determine its necessity, and
- Elimination of a second carbon stripping tower and carbon polish at the NHOU Central Treatment Facility which is not necessary in terms of throughput to the system.

Honeywell concludes that this alternative best meets the nine CERCLA criteria for an effective remedy.

Response: EPA disagrees that this proposed alternative would be protective, and it does not meet the RAOs specified in this ROD. It does not address the 1,4-dioxane in NHE-2, which results in the treated water being unusable by LA DWP, and is too slow in implementation. EPA modeling has determined that NHE-2 is not of sufficient depth and needs to be deepened to capture the high concentration contaminant mass.

EPA modeling has also indicated that additional extraction wells are needed to provide sufficient containment. Results over the last 10 years have clearly indicated that the existing extraction well network is not sufficient to contain the plume. With the increased groundwater volume extraction that will result from the additional wells, a second carbon stripping tower is necessary. The need for the LPGAC has been addressed elsewhere in this appendix.

27. Currently, there is no data indicating the presence of chromium in groundwater between the former Bendix facility and the Rinaldi-Toluca wellfield. NHE-1 has not been tested for chromium or hexavalent chromium. There is only one monitoring well in this area (NH-VPB-06), which has a chromium concentration of 2.4 µg/L. Production wells along the southeast end of the Rinaldi-Toluca well field have chromium levels of <2 µg/L. A groundwater sample from newly-installed groundwater monitoring well R-2, located near the southeastern edge of the Rinaldi-Toluca wellfield, indicates only 0.83 ug/L hexavalent chromium. Field screening during the installation of monitoring well T-1, located southeast of the wellfield, indicates less than 0.27 ug/L hexavalent chromium. The cost estimate of \$30 million for these new extraction wells and ex situ chromium treatment is too much to commit for a contingency that may or may not happen.

Protection of the Rinaldi-Toluca wellfield should be addressed in the Groundwater Management Plan, not by \$30 million in remedy costs. The Groundwater Management Plan could include monitoring of NHOU T-1 and T-2 as sentinel wells. There will be ample time to evaluate the most cost-effective response if chromium is observed in these wells. The ROD could include a contingency in the event that monitoring and sampling of these wells indicates chromium migration toward the Rinaldi-Toluca well field. The contingency should consider other potential more effective and less costly alternatives such as Rinaldi-Toluca wellhead treatment or a transportable treatment unit. In the absence of data, EPA's approach, as presented in this FFS, could result in expensive and inefficient remedial action with the outcome being additional production well shutdown, resulting in diminished drinking water supplies.

Response: Regarding the comment that the ROD could include a contingency in the event that chromium migration toward the Rinaldi-Toluca well field is detected, contamination by VOCs and emerging contaminants is also a concern for these water supply wells. The three proposed new extraction wells in the vicinity of NHE-1 are intended to intercept contaminated groundwater migrating toward these water supply well fields under the maximum pumping scenario anticipated by LADWP, and to significantly expand contaminant plume capture under the average pumping scenario. If new data collected prior to, or during, remedial design indicates that a different configuration of extraction wells is more effective and cost efficient than the configuration described in the Proposed Plan, then that different configuration will be considered for implementation as part of the Second Interim Remedy. Similarly, if new data collected prior to completion of the remedial design indicate that chromium treatment as set forth in Alternative 4a is not needed to meet performance standards over the life of the Selected Interim Remedy, then a lesser degree of chromium treatment will be considered. The converse condition is also true for both issues (i.e., if more extraction wells/treatment than predicted is needed to achieve the RAOs, then those features will be added).

28. The FFS states or implies that Honeywell owns or operates the former Bendix facility. The correct term for the facility is "former Bendix facility." These references should be corrected in the FFS and in future documents or presentations so that the Site is referred to as the "former Bendix facility," and when Honeywell's role is described, that it be made clear that Honeywell is the corporate successor to the previous Site owners and operators, Bendix Corporation and AlliedSignal, Inc.

Response: In the reports and work plans received by EPA from Honeywell and its consultants through 2009, the facility is labeled “the Honeywell North Hollywood Site” in report titles, text, and figures, rather than “the former Bendix facility.” Therefore, the FFS simply follows the Site naming convention used by Honeywell for many years. EPA does not believe that the comment requires issuing a correction to the FFS and Proposed Plan. However, the Site will be referred to as “the former Bendix facility” in the ROD and future EPA documents.

29. The Chronology of North Hollywood Operable Unit Events (Table 1-1) should include more key dates for significant milestones and events.

Response: The Focused Feasibility Study included the key dates that EPA felt were relevant for a document of this nature.

30. Per the text, the plume maps (Figures 1-3 to 1-7) are based on 2007 data, where available, and historical data where few recent data are available. The plume to the northwest of the NHOU Central Treatment Facility in Figure 1-3 indicates trichloroethene (TCE) concentrations exceeding 100 µg/L. This data is not presented in either Figure 2-3 or Appendix A – Summary of Recent Analytical Data (January 2003 through December 2007). The source of this data should be provided or the plume maps refined.

Response: Figures 1-3 through 1-7 are intended to provide an overview of the distribution of selected contaminants throughout the basin, and Figures 2-2 through 2-13 are used for target volume development. The TCE, PCE, and chromium distribution maps shown on Figures 1-3 through 1-7 are adapted from the annual monitoring reports prepared by EPA for the San Fernando Valley basin, and represent different time frames and aquifer depth intervals than were used in Figures 2-2 through 2-13. Therefore, the contours shown on these different sets of maps are somewhat different. Data for Figures 1-3 through 1-7 are provided in the San Fernando Valley Superfund Sites Groundwater Monitoring Program report for 2007, prepared in July 2009.

31. Figure 1-8 of the In-Situ Chromium Treatment is not correct.

Response: Figure 1-8 of the FFS consists of an exact copy of the schematic diagram for in situ chromium treatment as shown on Figure 7 of the “Soil and Interim Groundwater Remedial Action Plan for Reduction of Hexavalent Chromium—Former Honeywell North Hollywood Site,” prepared by MWH Americas on behalf of Honeywell on July 30, 2004. The updated version of this figure submitted by the commenter is helpful, but does not change the analysis or conclusions of the FFS or Proposed Plan.

32. Per the fourth paragraph of this section, it is noted that recent peak concentrations of total chromium have exceeded the California maximum contaminant level (MCL) by a factor of nearly 1000 ($50 \mu\text{g/L} \times 1000 = 50,000$). These peak concentrations were present in fourth quarter 2006 under the former Bendix facility when the groundwater elevation was higher than it had been since prior to 2000. As presented in the Groundwater Monitoring Report, Second Quarter 2009, Honeywell North Hollywood Site, the maximum detected hexavalent chromium concentration in groundwater at the Site is 1,500 µg/L, not 50,000 µg/L.

Response: The comment notes that the maximum detected hexavalent chromium concentration at the former Bendix facility was 1,500 µg/L in the second quarter of 2009, and was nearly 50,000 µg/L in the fourth quarter of 2006. It should also be noted that the maximum hexavalent chromium concentration was 9,100 µg/L in 2005, 15,000 µg/L in 2004, and 27,000 µg/L in 2003. These concentrations illustrate the variability in hexavalent chromium concentrations (similar to total chromium concentrations) in wells at the former Bendix facility. Based on historical concentrations, it is reasonable to assume that total and hexavalent chromium concentrations at the facility will again exceed 10,000 µg/L at or downgradient from the former Bendix facility.

33. The FFS incorrectly states that groundwater flow velocities are greatest where hydraulic conductivities are highest (p. 2-5). In fact, groundwater velocities are a function of both the hydraulic gradient and hydraulic conductivity. Hydraulic gradients within much of the NHOU area are relatively flat.

Section 2.3 of the FFS does not acknowledge any uncertainty in the hydrogeologic conceptual model of the NHOU area, nor does it anticipate potential improvements in the hydrogeologic conceptual model as a result of new data obtained from the 33 groundwater monitoring wells. These data may significantly alter the conceptual model and improve the predictive capability of groundwater modeling.

Response: The groundwater velocity discussion on page 2-5 of the FFS summarizes conclusions of the 1992 Remedial Investigation (RI) for the SFV Superfund Sites (including NHOU) and states that “Groundwater flow velocities in the NHOU were estimated during the RI to range from approximately 290 to 1,000 feet per year, depending on location. Estimated groundwater flow velocities are generally highest in the area of the NHOU extraction system where aquifer hydraulic conductivities are highest.” EPA understands that groundwater velocities are a function of hydraulic gradient and hydraulic conductivity, as well as effective porosity. Hydraulic conductivity can vary by orders of magnitude in an aquifer, whereas hydraulic gradient and effective porosity typically are much less variable. Therefore, groundwater velocities are commonly highest in areas of an aquifer with the highest hydraulic conductivity. However, EPA recognizes that steep hydraulic gradients can develop around active production and extraction well fields, which can result in high groundwater velocities in the immediate vicinity of the well fields, primarily a result of gradient rather than hydraulic conductivity.

Horizontal hydraulic gradients in many alluvial basin-fill aquifers, such as the SFV Basin aquifer, are “relatively flat” (commonly in the range from 1 foot of head change per 1,000 feet of horizontal distance to 1 foot head change per 100 feet of horizontal distance). Groundwater still moves under these “relatively flat” gradients, and is capable of transporting dissolved constituents such as naturally occurring minerals or anthropogenic contaminants significant distances.

Regarding the last part of the comment (uncertainty in the conceptual Site model), please see the response to Comment 2. EPA plans to continue updating the conceptual model and the numerical models for groundwater flow in the SFV Superfund Sites as

new data are received that indicate that model improvements and revisions would be appropriate.

34. The FFS's distinction between shallow and deep contaminated zones may be misleading in areas where Depth Region 1 is periodically dry. In these areas, plotted values for Depth Region 2 may represent the top of the saturated zone at the time of sampling, rather than evidence of downward contaminant migration.

Response: It is correct that in areas where Depth Region 1 is periodically dry (the north part of NHOU) "plotted values for Depth Region 2 may represent the top of the saturated zone at the time of sampling." However, EPA disagrees with the suggestion that such an occurrence would not be "evidence of downward contaminant migration." If contamination is transported from Depth Region 1 to Depth Region 2 due to declining water levels, that represents downward contaminant migration.

35. It should be noted that there are discrepancies between the EPA database and the data presented in the FFS. The following examples include 1,4-dioxane concentrations that are presented in the database but are not discussed in Section 2.6.2 or presented in Appendix A:

Detected Concentration	Monitoring Well	Sampling Date
20 µg/L	NH-C01-324	3/14/07
20 µg/L	NH-C02-325	3/12/07
20 µg/L	NH-VPB-02	3/12/07
20 µg/L	NH-VPB-05	3/12/07
20 µg/L	NH-VPB-06	3/12/07
100 µg/L	NH-C05-460	3/14/07
100 µg/L	NH-C06-285	3/13/07

The concentrations and dates suggest the data may be subject to further scrutiny and the FFS should not exclude it without explanation. This is an important issue because the FFS currently focuses on 1,4-dioxane only in the vicinity of extraction well NHE-2 and the data above suggest that 1,4-dioxane concentrations could be more widespread within the NHOU.

Response: There are not substantial discrepancies between the SFV database and the data reported in the FFS. The 1,4-dioxane values tabulated in the comment above appear to have been obtained from the March 2008 update of the SFV database shared with the public. The values were flagged as "rejected" in that database update, and were removed from subsequent database updates (December 2008, April 2009). These 1,4-dioxane values were flagged as rejected, and later removed, because the laboratory mistakenly listed the reporting limits as detected concentrations (note that six of the referenced concentrations are precisely 20 µg/L and the remaining two are precisely 100 µg/L); this error was noticed immediately during data validation, resulting in

rejection of the data. 1,4-dioxane concentrations in previous (and subsequent) groundwater samples from these wells were either non-detectable (most samples) or below the notification level of 3 µg/L. It is recommended that the commenter use one of the more recent updates of the SFV database for tabulation of data; the updates contain data obtained in late 2008 and early 2009, and have removed rejected data (e.g., the 1,4-dioxane values listed above).

The FFS focuses on 1,4-dioxane primarily (but not exclusively) in the vicinity of extraction well NHE-2 because that it is where 1,4-dioxane concentrations are most likely to have a significant negative impact on operation of the existing or proposed remedy. Furthermore, concentrations of 1,4-dioxane at several monitoring wells immediately upgradient from NHE-2 at the former Bendix facility have exceeded the state notification level by a factor of 10 or more. These are the highest levels of 1,4-dioxane detected in the vicinity of the NHOU. These high levels of 1,4-dioxane would have a significant negative impact on groundwater treatment at the NHOU if they reached the existing or proposed NHOU treatment system, unless it included treatment for 1,4-dioxane.

36. In summarizing the rationale for additional monitoring wells (p. 2-13), the first bullet should be revised as follows:

Adequately characterize the lateral and vertical extent of contaminant plumes and known hotspot areas and their relationship to known *and potential* source areas.

The logic behind the labeling and grouping of EPA's proposed additional monitoring wells is unclear (Figure 2-14). The rationale provided in Table 2-1 for each proposed cluster of monitoring wells consists largely of redundant verbiage and lacks adequate detailed explanations. The FFS should link each proposed well to one or more upcoming critical decisions and describe how the information obtained from these wells will successfully contribute to the decision-making process (i.e., EPA's Data Quality Objectives process).

Detailed comments on the proposed monitoring wells are as follows:

- Location A: The well proposed at Location A is intended to define the hydraulic gradient between the Rinaldi-Toluca well field and the former Bendix facility. Because there will be groundwater depressions around each of the pumping systems, at least two wells will be necessary to understand the hydraulic gradient and whether a hydraulic divide already exists.
- Location C: The rationale for installing four monitoring wells east of Vineland Avenue and Vanowen Street warrants further discussion. Existing wells 3830Q and 3830S may negate the need for at least one of these monitoring wells.

Furthermore, this section should address the 33 new groundwater monitoring wells and ongoing investigation activities that Honeywell has proactively agreed to complete under the AOC. These new wells should also be addressed in Sections 4.2.2 and 4.3.1.2. The resultant data from these wells should be considered in the analysis and evaluation of the Second Interim Remedy.

Response: Development of a detailed set of data quality objectives and specific monitoring well locations or rationale is more appropriate for the remedial design effort. At the feasibility study level, determination of the approximate number and locations for new monitoring wells required to monitor the proposed remedy and provide additional delineation of groundwater plumes was performed for cost estimating purposes only. Construction of 33 new groundwater monitoring wells by Honeywell's consultants began at approximately the same time that the FFS was released, and the work plan for monitoring well construction was not finalized until a month after FFS release. The resultant data from the new monitoring wells, when provided to EPA (expected in December 2009), will be used in remedial design.

37. The FFS does not state the point of compliance with the cleanup levels. The third paragraph in this section indirectly states that drinking water standards should not be exceeded in the treated water from the NHOU treatment system. We assume that wellhead treatment systems will need to reduce contaminant levels to allow for drinking water standards to be met at the NHOU treatment system.

Response: The point of compliance has been clarified in this ROD, and is specifically the point where the treated water leaves the NHOU treatment plant, after going through the "double barrier" treatment system, and just before it enters the LADWP blending facility.

38. Summary Table 4.3 for the conceptual anion exchange treatment system defines the type of resin proposed as Duolite™ A7, which is a weak based resin. No rationale is presented for proposing a weak based resin versus a strong based resin. We recommend that the FFS does not stipulate a specific resin since selection of the resin is a design issue.

Response: The ROD does not specify the resin. It is agreed that this is a design issue.

39. If treatment for 1,4-dioxane is required, other advanced oxidation process (AOP) treatment technologies should be considered and tested.

Response: The ROD allows flexibility during the design on the specific treatment technology for 1,4-dioxane.

40. The 1,4-dioxane data for NHE-2 identified in this section indicates that concentrations have ranged from 4 µg/L to 9 µg/L. Data available to Honeywell indicate that results at NHE-2 have ranged from 2.4 µg/L to 7 µg/L. The maximum detected concentration of 1,4-dioxane identified in Appendix A for the time period January 2003 through December 2007 is also 7 µg/L. Please identify the sample specifics justifying the 9 µg/L maximum or revise the range identified in this section.

The FFS cites that 1,4-dioxane has ranged from 4 µg/L to 7 µg/L between 2007 and 2008. In the first quarter of 2009, the 1,4-dioxane level was 2.4 µg/L. 1,4-dioxane concentrations in the NHE-2 influent have ranged from 2.4 µg/L to 5 µg/L since 2008 and the CDPH Notification Level is 3 µg/L. The marginal detections of 1,4-dioxane above a CDPH Notification Level of 3 µg/L should not immediately trigger the need for an AOP at the NHE-2 wellhead. A broader set of more recent groundwater sampling results, as well as the flow rates from other extraction wells and the NHOU Central Treatment Facility influent concentrations, should be used along with modeling to evaluate the toxicological risk

associated with 1,4-dioxane treatment at the NHE-2 wellhead versus no treatment. The results of these analyses, in conjunction with the 97-005 process, should be used to determine the need for treatment.

Response: The reference to 9 µg/L in Section 4.3.1.2 is a typographical error. However, concentrations of 1,4-dioxane as high as 90 µg/L have been detected at the former Bendix facility, within ¼ mile upgradient from extraction well NHE-2. Therefore, it is prudent to plan for wellhead treatment for 1,4-dioxane at extraction well NHE-2 (see response to Comment 35). In addition, it is anticipated that this will be a CDPH requirement for the end use chosen in this ROD under the 97-005 process.

41. After reviewing Section 4.3.4 of the FFS, it appears that an evaluation will need to be conducted to determine which wells require treatment and to what concentrations in order to “decrease total chromium concentrations in the NHOU central treatment plant effluent to 5 ug /L.” Cleanup goals need to balance toxicological risk with, consideration of the appropriate point of compliance and the use of blending when appropriate. A broader set of more recent groundwater sampling results from nearby monitoring wells and the concentrations from other extraction wells should be used along with modeling to evaluate the need for treatment.

Note that Honeywell would like the FFS/Proposed Plan to consider evaluating use of the existing equipment at the former Bendix facility for treatment of the chromium from NHE-2. It may be possible to secure access agreements allowing the extracted groundwater to be conveyed to the former Bendix facility where the existing ion exchange vessels could be used for chromium treatment.

Response: Evaluation of recent chromium trends at the extraction wells and at upgradient monitoring wells was conducted by EPA to determine which extraction wells will likely require chromium treatment in the future. The remedial design can consider use of the existing equipment at the former Bendix facility for chromium treatment.

42. Figures 4-15 and 4-16 illustrate simulated flowlines generated from groundwater modeling of the proposed pumping rates for the extraction wells under Alternative 4a (the selected alternative). For forward particle tracking, the flowlines represent the path that will be taken by particles released at specific points at a specified time. However, if the particles are released when the flow field changes substantially, the flowlines will follow different paths. Therefore, in a groundwater basin such as the San Fernando Valley, where pumping from water supply wells changes significantly, flowline information needs to be interpreted with caution. When pumping changes significantly with time, contaminant transport simulation will provide a better interpretation of plume movement because, unlike particle tracking, the entire plume does not instantaneously leave its starting location. A portion of the plume still lingers at the starting location and can react to the changing flow field.

The discussion regarding the maximum production scenario seems to suggest flow from Depth Region 1 (DR-1) at the former Bendix facility to the Rinaldi-Toluca well field. Because DR-1 is likely to be dewatered at the former Bendix facility under this pumping condition, there can be no saturated flow and consequently, no chemical migration in that

depth region from the former Bendix facility to the Rinaldi-Toluca well field. There will, however, be flow in DR-2 from the former Bendix facility to the Rinaldi-Toluca well field.

The pumping/flow rates may be overly conservative. The proposed flow rate of over 3,000 gallons per minute (gpm), in combination with the Maximum Pumping Scenario, is likely to dewater DR-1 and, therefore, is not feasible given the Watermaster's safe yield. Balancing regulatory storage requirement/safe yield for the San Fernando Basin versus the Maximum Pumping Scenario used to justify the addition of the three new wells needs to be addressed, along with concerns regarding contaminant plume migration and production well shutdown.

Response: The flowlines on Figures 4-15 and 4-16 were projected in the model-forecast NHOU flow field including both extraction well pumping and LADWP's anticipated future average pumping scenario in the San Fernando Valley. The uncertainty that is inherent in those pumping forecasts makes analysis of every possible future pumping scenario impractical. Such exhaustive modeling is unnecessary to assess the relative merits of the remedial alternatives at the feasibility study level. Addition of flowlines in subsequent model years in the predictive simulations would be expected to follow similar paths to those shown on Figures 4-15 and 4-16.

For the maximum pumping scenario for water supply in the San Fernando Valley, the same flowline starting locations were used in the flow field that resulted from planned extraction well pumping and LADWP forecasts of future maximum pumping scenario. As shown on Figures 4-17 and 4-18 and discussed in the FFS text, the modeling indicates that while the increased production "significantly influences the extent of hydraulic containment," Alternatives 2a through 5b are still forecasted to "provide complete containment of the main body of the western 50 µg/L VOC target volume despite a strong hydraulic gradient to the northwest." Therefore, the FFS modeling effort forecasts that the Second Interim Remedy includes robust hydraulic containment of the key source zone in the vicinity.

Depth Region 1 is forecasted to become unsaturated in some areas due in part to the additional groundwater extraction assumed in the remedial alternatives. However, the statement "there can be no saturated flow and consequently, no chemical migration in that depth region from the former Bendix facility to the Rinaldi-Toluca well field" is mistaken. Groundwater recharge, for example, will allow contaminant transport to the saturated zone if mobile contaminants are present in the vadose zone. Moreover, the Rinaldi-Toluca well field is screened in Depth Regions 2 and 3, and if water levels in the vicinity of the former Bendix facility decline, it can be assumed that dissolved contaminants, particularly VOCs, will migrate downward with the groundwater. Therefore, even if Depth Region 1 becomes desaturated, contaminants can still migrate from the former Bendix facility to the Rinaldi-Toluca well field.

The quantity of sustainable pumping in the San Fernando Valley basin depends not only on pumping rates, but also on the amount of spreading basin recharge that is applied. As noted above, the maximum pumping scenario modeled in the FFS is considered to be on the upper end of the range of possible future pumping rates, and was used in the FFS primarily to illustrate that the hydraulics of Alternatives 2a

through 5b are hydraulically robust enough to capture the groundwater under the former Bendix facility source area even under these extreme conditions.

43. Extraction well NHE-1 is dry and has never been operational. Deepening NHE-1 requires further evaluation. Since NHE-1 has never operated, the orientation of the plume from the former Bendix facility has been determined by the groundwater flow direction and the extraction rates of LADWP's pumping of the NHOU extraction wells. Rehabilitating NHE-1 may alter this flow direction, causing chromium and VOC migration to the northwest.

If the purpose of the Second Interim Remedy is to contain the high concentration contaminant plumes, it may be premature to deepen NHE-2. Geologic cross-sections provided as ***Attachments 7a and 7b*** (extracted from the *Groundwater Monitoring Report, Second Quarter 2009, Honeywell North Hollywood Site*) indicate that VOCs and hexavalent chromium extend to a depth of approximately 330 feet below ground surface (bgs) and the high concentration portion is above 300 feet bgs. The NHE-2 well is screened between 190 and 300 feet bgs. When vertical flow fields are considered, the wells current configuration may be acceptable to achieve the performance goal. The need for a deeper well may depend upon the lateral extent of the plume and the subsequent pumping rate need for capture. The results of the ongoing NHOU 33 groundwater monitoring well installation should provide the information necessary to make this determination.

NHE-4 has not been operated since February 2008 and NHE-5 has not operated since December 2005. While we recognize that deepening of these wells may be necessary to obtain the desired hydraulic capture for Depth Region 1, the well design must, nevertheless, minimize plume smearing. The well design should either include separate shallow and deep wells, or a packer system in the well to hydraulically isolate the Depth Zones.

To the extent that deepening of these wells is part of a water supply strategy, this is not a 'necessary' remedial measure or response cost under CERCLA. (See, *City of Moses Lake v. United States*, 458 F. Supp. 2nd 1198 (E.D. Wash. 2006); *Santa Clara Valley Water District v. Olin Corp.*, N.D. Cal., No. 07-3756, 2009 WL 2581290 Aug. 19, 2009.). Costs that are principally for water supply or provision of municipal services cannot be passed to PRPs as part of a putative "remedy"; they remain the responsibility of the water supply agency or municipality.

Response: EPA agrees that details regarding the depths and approach to deepening the extraction wells should be further evaluated, and is best considered during remedial design. The possibility of constructing separate shallow/deep well pairs or using packers, rather than simply deepening existing wells, is suggested as an option in the FFS. Deepening the wells is proposed in the FFS to allow sufficient long-term pumping rates to achieve hydraulic containment; deepening of the wells is not part of a water-supply strategy.

44. The number and size of the air stripping and carbon treatment equipment at the NHOU Central Treatment Facility will need to be re-evaluated once the target cleanup area has been further identified and the location and pumping rates of wells has been determined. It is possible that the design of the Second Interim Remedy will show that only one air stripper and carbon treatment unit will be adequate or that other treatment trains may be necessary (i.e., 1,4-dioxane or chromium treatment).

Response: EPA agrees that details of the treatment system should be further evaluated during the remedial design effort. However, when sizing treatment units, long-term average pumping rates required to meet RAOs must be considered together with estimates of treatment system downtime for maintenance and repairs. For example, if only one treatment train is constructed, and it is anticipated to be operational 80% of the time (20% downtime assumed for maintenance and repairs), then the extraction wells should be designed to operate at 125% of the design long-term average discharge rate (because the wells will only operate 80% of the time). Two smaller, parallel treatment trains may be somewhat more costly to construct than a single large-capacity treatment train, but their presence will provide more options for keeping the treatment system partly operational when individual components require maintenance or replacement. Such redundancy would have the potential to reduce overall system downtime and improve performance and efficiency of the system.

45. Section B.2.2 of the FSS states that recalibration of the model was improved by increasing vertical and horizontal hydraulic conductivity by 50%. It is not clear why this was considered appropriate. Before such drastic changes are undertaken, it would seem that the hydrogeologic Conceptual Site Model should be re-evaluated, since increasing hydraulic conductivity significantly affects flow rates. Discrepancies in the calibration of the numerical model, as shown on Figure 7 of Appendix B of the FFS, may be caused by the use of inaccurate hydraulic parameters, such as hydraulic conductivity (see Figures 3, 4, 5 and 6), effective porosity, storage coefficient, anisotropy, and dispersivities. Spatial variability of hydraulic parameters should be treated geostatistically to determine expected values, spatial correlation, and estimated uncertainties. Once the ongoing NHOU groundwater characterization activities have been completed, the groundwater model should be re-calibrated and sensitivity analyses conducted to refine the number, location, and pumping rates of the extraction wells.

Response: As is standard practice in model calibration, the aquifer parameters in the SFV model used for the FFS modeling were modified to adjust the “goodness of fit” to the calibration. The hydraulic conductivities that were ultimately selected in the model are consistent with the presence of coarse sand and gravel aquifer materials that were observed as drill cuttings during installation of the Remedial Investigation wells in the early 1990s.

The principal hydraulic goal of the proposed remedial alternatives is containment of contaminants over the long term. Of the specific parameters mentioned in this comment, hydraulic conductivity and aquifer anisotropy are the most important in the design of a pump-and-treat system that operates at a relatively steady pumping rate. These parameters will be reconsidered following the current additional groundwater investigation of the NHOU. Transport modeling that includes dispersivity (and perhaps other contaminant transport parameters) should be considered for the remedial design effort.

Geostatistical analysis proposed in the comment would not necessarily mitigate modeling uncertainty (unless a system is so robust that the aquifer parameters input to the model have little effect on the model outcome), but instead provides a basis for

describing the uncertainty in detail. Geostatistical analysis can be considered in the remedial design phase, but was unnecessary at the feasibility study level.

For these reasons, the parameters chosen for the FFS modeling are considered by EPA to be conservative and appropriate for the required level of analysis and comparison of the FFS remedial alternatives.

46. In the comparison spreadsheet of EPA's alternative vs. Honeywell's proposed alternative for 1-4 dioxane treatment, the capital cost and operations and maintenance (O&M) cost are the same. However, while calculating the net present value (NPV) for 26 years at 7%, there is a discrepancy between EPA's and our calculations. The NPV for Honeywell's alternative was calculated using the following formula:

$$PV(0.07,26,H24,0,0)+G24$$

where:

H 24 = O&M cost

G 24 = capital cost.

Even though Honeywell's approach is the same as EPA's, Honeywell's NPV 7% value, based on the formula above, is \$5.7 million vs. EPA's value of \$4.7 million. Please verify the basis for EPA's calculation. Also, note that in **Attachment 2** of this letter, we did not change the NPV for EPA's alternative.

Response: Based on the information presented in the comment the Honeywell NPV calculation assumes a 26-year discount period for this component starting the first year of construction. The NPV calculated in the FFS assumed a 27-year discount period that starts three years after construction of the rest of the extraction and treatment system. In other words, the NPV of the 1,4-dioxane treatment system is further discounted due to the delay in its construction.

47. Appendix E of the FFS and Figure 2-1 both identified selected "Facility Locations" (i.e., potential sources). The listed locations tend to be Sites where a known release has occurred (i.e., soil or groundwater data exists confirming a release) but the list appears to be incomplete. Lockheed Building 528 and Hangar 22 are not mentioned. Also, several of the smaller degreaser/plating operations identified by MWH Americas, Inc. (MWH) were not included (i.e., Skipower Plating, AAA Plating, Caravan Fashions, F&H Plating, Nickel Solutions Recycling, Electromatic, etc.). Honeywell has also identified other entities that are known to have impacted the subsurface. These entities are provided in **Attachment 4**.

Response: The source areas were mentioned only as a reference. The EPA acknowledges that there is ongoing work for source identification, and the intent is to identify and address as many sources as possible in the NHO.

UNITED STATES DISTRICT COURT
DISTRICT OF CALIFORNIA
CENTRAL DIVISION

----- X	
UNITED STATES OF AMERICA	:
	:
	:
Plaintiffs,	:
	:
v.	:
	:
_____, INC.,	:
	:
Defendants.	:
----- X	

Civil No.

CONSENT DECREE

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I. BACKGROUND

A. The United States of America (“United States”), on behalf of the Administrator of the United States Environmental Protection Agency (“EPA”), filed a complaint in this matter pursuant to Sections 106 and 107 of the Comprehensive Environmental Response, Compensation, and Liability Act (“CERCLA”), 42 U.S.C. §§ 9606, 9607.

B. The United States in its complaint seeks, *inter alia*: (1) reimbursement of costs incurred by EPA and the Department of Justice for response actions at and in the vicinity of the North Hollywood Operable Unit of the San Fernando Valley Area 1 Superfund Site in Los Angeles, California, (“NHO”) together with accrued interest; and (2) performance of response actions by the defendants at the NHO consistent with the National Contingency Plan, 40 CFR Part 300 (as amended) (“NCP”).

C. In accordance with the NCP and Section 121(f)(1)(F) of CERCLA, 42 U.S.C. § 9621(f)(1)(F), EPA notified the State of California (the “State”) on November 19, 2009, of negotiations with potentially responsible parties (“PRPs”) regarding the implementation of the remedial design and remedial action for the NHO, and EPA has provided the State with an opportunity to participate in such negotiations and be a party to this Consent Decree.

D. In accordance with Section 122(j)(1) of CERCLA, 42 U.S.C. § 9622(j)(1), EPA notified the United States Department of the Interior and the National Oceanic and Atmospheric Administration on February 22 and February 25, 2010, respectively, of negotiations with PRPs regarding the release of hazardous substances that may have resulted in injury to the natural resources under federal trusteeship and encouraged the trustee(s) to participate in the negotiation of this Consent Decree.

E. The defendants that have entered into this Consent Decree (“Settling Defendants”) do not admit any liability to Plaintiff arising out of the transactions or occurrences alleged in the complaint, nor do they acknowledge that the release or threatened release of hazardous substance at or from the NHO constitutes an imminent and substantial endangerment to the public health or welfare or the environment.

F. Pursuant to Section 105 of CERCLA, 42 U.S.C. § 9605, EPA placed the Site on the National Priorities List, set forth at 40 CFR Part 300, Appendix B, by publication in the Federal Register on June 10, 1986, 51 Fed. Reg. 21054.

G. In response to a release or a substantial threat of a release of a hazardous substance at the NHO, the Los Angeles Department of Water and Power (“LADWP”), pursuant to a March 6, 1986 cooperative agreement with EPA, conducted a Remedial Investigation and Feasibility Study (“RI/FS”) for the NHO pursuant to 40 CFR § 300.430. LADWP completed its RI/FS report on November 17, 1986.

H. EPA signed an interim record of decision for the NHO on September 23, 1987 (“First Interim ROD”), selecting a groundwater extraction and treatment remedy in order to contain the plume of volatile organic compound contamination in the aquifer and to remove contaminant mass (“First Interim Remedy”).

I. The First Interim Remedy was constructed to operate in conjunction with LADWP’s North Hollywood municipal water treatment and distribution plant. Since its startup,

the First Interim Remedy has been operated by LADWP under a series of cooperative agreements with EPA. In 1996 and 1997, thirty seven parties entered into consent decrees with the United States, in which they agreed to (1) reimburse the United States for all NHOU past costs and a proportional share of past Basin-wide costs, and (2) pay future costs to operate and maintain the First Interim Remedy for the remainder of its fifteen-year term.

J. In 1992, LADWP conducted a Basin-wide remedial investigation (“RI”) to study the groundwater flow patterns and the nature and extent of contamination in the eastern half of the San Fernando Valley groundwater aquifer (the “Basin”), which includes the Site as well as three other San Fernando Valley Superfund sites. LADWP’s effort included installation of groundwater monitoring wells, collection of data, and preliminary development of a groundwater flow model. The Basin-wide RI was developed in order to explore the possibility of completing a Basin-wide groundwater remedy. To date, no Basin-wide remedy has been developed.

K. Following LADWP’s 1992 Basin-wide RI, EPA developed a monitoring program for the Basin and continued collecting samples from a network of 84 RI groundwater monitoring wells, 23 of which were located in the NHOU. EPA relied on data from a total of 137 monitoring wells in and around the NHOU as well as additional data provided by LADWP and the Settling Defendants to prepare a focused feasibility study (“FFS”) in 2009 that identified alternatives for a new remedy at the NHOU.

L. Pursuant to Section 117 of CERCLA, 42 U.S.C. § 9617, EPA published notice of the completion of the FFS and of the proposed plan for remedial action on July 8, 2009, in a major local newspaper of general circulation. EPA provided an opportunity for written and oral comments from the public on the proposed plan for remedial action and held a public meeting on July 21, 2009. A copy of the transcript of the public meeting is available to the public as part of the administrative record upon which EPA Region IX based the selection of the response action.

M. EPA’s decision regarding implementation of the remedial action at the NHOU is embodied in the Second Interim Record of Decision (“ROD”), executed on September 30, 2009, on which the State has given its concurrence. The ROD includes a responsiveness summary to the public comments. Notice of the final plan was published in accordance with Section 117(b) of CERCLA, 42 U.S.C. § 9617(b).

N. Based on the information presently available to EPA, EPA believes that the Work will be properly and promptly conducted by Settling Defendants if conducted in accordance with the requirements of this Consent Decree and its appendices.

O. Solely for the purposes of Section 113(j) of CERCLA, 42 U.S.C. § 9613(j), the Remedial Action set forth in the ROD and the Work to be performed by Settling Defendants shall constitute a response action taken or ordered by the President for which judicial review shall be limited to the administrative record.

P. The Parties recognize, and the Court by entering this Consent Decree finds, that this Consent Decree has been negotiated by the Parties in good faith and implementation of this Consent Decree will expedite the cleanup of the NHOU and will avoid prolonged and complicated litigation between the Parties, and that this Consent Decree is fair, reasonable, and in the public interest.

NOW, THEREFORE, it is hereby Ordered, Adjudged, and Decreed:

II. JURISDICTION

1. This Court has jurisdiction over the subject matter of this action pursuant to 28 U.S.C. §§ 1331 and 1345, and 42 U.S.C. §§ 9606, 9607, and 9613(b). This Court also has personal jurisdiction over Settling Defendants. Solely for the purposes of this Consent Decree and the underlying complaint, Settling Defendants waive all objections and defenses that they may have to jurisdiction of the Court or to venue in this District. Settling Defendants shall not challenge the terms of this Consent Decree or this Court's jurisdiction to enter and enforce this Consent Decree.

III. PARTIES BOUND

2. This Consent Decree applies to and is binding upon the United States and upon Settling Defendants and their heirs, successors, and assigns. Any change in ownership or corporate status of a Settling Defendant including, but not limited to, any transfer of assets or real or personal property, shall in no way alter such Settling Defendant's responsibilities under this Consent Decree.

3. Settling Defendants shall provide a copy of this Consent Decree to each contractor hired to perform the Work required by this Consent Decree and to each person representing any Settling Defendant with respect to the NHOU or the Work, and shall condition all contracts entered into hereunder upon performance of the Work in conformity with the terms of this Consent Decree. Settling Defendants or their contractors shall provide written notice of the Consent Decree to all subcontractors hired to perform any portion of the Work required by this Consent Decree. Settling Defendants shall nonetheless be responsible for ensuring that their contractors and subcontractors perform the Work in accordance with the terms of this Consent Decree. With regard to the activities undertaken pursuant to this Consent Decree, each contractor and subcontractor shall be deemed to be in a contractual relationship with Settling Defendants within the meaning of Section 107(b)(3) of CERCLA, 42 U.S.C. § 9607(b)(3).

IV. DEFINITIONS

4. Unless otherwise expressly provided in this Consent Decree, terms used in this Consent Decree that are defined in CERCLA or in regulations promulgated under CERCLA shall have the meaning assigned to them in CERCLA or in such regulations. Whenever terms listed below are used in this Consent Decree or in the appendices attached hereto and incorporated hereunder, the following definitions shall apply solely for purposes of this Consent Decree:

"Basin-wide Costs" shall mean all costs that the United States has incurred or may incur for investigations or response actions conducted in the San Fernando Valley Area 1, Area 2, Area 3, or Area 4 Superfund sites that are not specific to any one site or operable unit.

"CERCLA" shall mean the Comprehensive Environmental Response, Compensation, and Liability Act of 1980, as amended, 42 U.S.C. §§ 9601, *et seq.*

"Consent Decree" or "Decree" shall mean this Consent Decree and all appendices attached hereto (listed in Section XXVIII). In the event of conflict between this Consent Decree and any appendix, this Consent Decree shall control.

The term “day” shall mean a calendar day unless expressly stated to be a working day. The term “working day” shall mean a day other than a Saturday, Sunday, or federal holiday. In computing any period of time under this Consent Decree, where the last day would fall on a Saturday, Sunday, or federal holiday, the period shall run until the close of business of the next working day.

“Effective Date” shall be the date upon which this Consent Decree is entered by the Court as recorded on the Court docket, or, if the Court instead issues an order approving the Consent Decree, the date such order is recorded on the Court docket.

“EPA” shall mean the United States Environmental Protection Agency and any successor departments or agencies of the United States.

“Future Response Costs” shall mean all NHOU response costs, including, but not limited to, direct and indirect costs that the United States incurs in reviewing or developing plans, reports, and other deliverables submitted pursuant to this Consent Decree, in overseeing implementation of the Work, in identifying additional responsible parties, or otherwise implementing, overseeing, or enforcing this Consent Decree, including, but not limited to, payroll costs, contractor costs, travel costs, laboratory costs, the costs incurred pursuant to Section XIII (Access and Institutional Controls) (including, but not limited to, the cost of attorney time and any monies paid to secure access and/or to secure, implement, monitor, maintain, or enforce Institutional Controls including, but not limited to, the amount of just compensation), Section XIV (Emergency Response), Paragraph 42 (Funding for Work Takeover), and Section XXVIII (Community Relations). Future Response Costs shall also include all Interim Response Costs, and all Interest on those Past Response Costs Settling Defendants have agreed to pay under this Consent Decree that has accrued pursuant to 42 U.S.C. § 9607(a) during the period from **[insert the date identified in the Past Response Costs definition]** to the Effective Date.

“Institutional Controls” shall mean Proprietary Controls and state or local laws, regulations, ordinances, zoning restrictions, or other governmental controls or notices that: (a) limit land, water, and/or resource use to minimize the potential for human exposure to Waste Materials at the NHOU; (b) limit land, water, and/or resource use to implement, ensure non-interference with, or ensure the protectiveness of the Remedial Action; and/or (c) provide information intended to modify or guide human behavior at the NHOU.

“Institutional Control Implementation and Assurance Plan” or “ICIAP” shall mean the plan for implementing, maintaining, monitoring, and reporting on the Institutional Controls set forth in the ROD, prepared in accordance with the SOW.

“Interim Response Costs” shall mean all costs, including direct and indirect costs, (a) paid by the United States in connection with the NHOU between **[insert the date identified in the Past Response Costs definition]** and the Effective Date, or (b) incurred prior to the Effective Date but paid after that date.

“Interest” shall mean interest at the rate specified for interest on investments of the EPA Hazardous Substance Superfund established by 26 U.S.C. § 9507, compounded annually on October 1 of each year, in accordance with 42 U.S.C. § 9607(a). The applicable rate of interest shall be the rate in effect at the time the interest accrues. The rate of interest is subject to change on October 1 of each year.

“LADWP” shall mean the Los Angeles Department of Water and Power and any successor departments or agencies.

“NHO” shall mean the North Hollywood Operable Unit of the San Fernando Valley Area 1 Superfund Site. The NHO comprises approximately 4 square miles of contaminated groundwater underlying an area of mixed industrial, commercial, and residential land use in the community of North Hollywood (a district of the City of Los Angeles). The NHO is located in the city of Los Angeles (approximately 15 miles north of downtown), Los Angeles County, California, and depicted generally on the map attached as Appendix C.

“NHO Special Account” shall mean the special account, within the EPA Hazardous Substances Superfund, established for the NHO by EPA pursuant to Section 122(b)(3) of CERCLA, 42 U.S.C. § 9622(b)(3), and the Partial Consent Decree in United States v. Allied-Signal, Inc., et al, Civil no. 93-6490-MRP (Tx).

“National Contingency Plan” or “NCP” shall mean the National Oil and Hazardous Substances Pollution Contingency Plan promulgated pursuant to Section 105 of CERCLA, 42 U.S.C. § 9605, codified at 40 CFR Part 300, and any amendments thereto.

“Paragraph” shall mean a portion of this Consent Decree identified by an Arabic numeral or an upper or lower case letter.

“Parties” shall mean the United States and Settling Defendants.

“Past Response Costs” shall mean all costs, including, but not limited to, direct and indirect costs, that the United States paid at or in connection with the NHO, including past Basin-wide costs attributed to the NHO, through **[insert the date of the most recent cost update]**, plus Interest on all such costs which has accrued pursuant to 42 U.S.C. § 9607(a) through such date.

“Performance Standards” shall mean the cleanup standards and other measures of achievement of the objectives of the Remedial Action and the Work, including those set forth in Section 2.13.2 (including Table 6) and 2.8 of the ROD and Section 1.3 of the SOW and any modified standards established pursuant to this Consent Decree.

“Plaintiff” shall mean the United States.

“Pre-Achievement O&M” shall mean (1) all operation and maintenance activities required for the Remedial Action to achieve Performance Standards, as provided under the Pre-Achievement O&M Plan approved or developed by EPA pursuant to Section VI (Performance of the Work by Settling Defendants) and the SOW, and (2) maintenance, monitoring, and enforcement of Institutional Controls as provided in the ICIAP, until Performance Standards are met.

“Post-Achievement O&M” shall mean (1) all activities required to maintain the effectiveness of the Remedial Action after Performance Standards are met, as required under the Post-Achievement O&M Plan approved or developed by EPA pursuant to Section VI (Performance of the Work by Settling Defendants) and the SOW, and (2) maintenance, monitoring, and enforcement of Institutional Controls after Performance Standards are met, as provided in the ICIAP.

“Proprietary Controls” shall mean easements or covenants running with the land that (a) limit land, water or resource use and/or provide access rights and (b) are created pursuant to common law or statutory law by an instrument that is recorded by the owner in the appropriate land records office.

“RCRA” shall mean the Solid Waste Disposal Act, as amended, 42 U.S.C. §§ 6901, *et seq.* (also known as the Resource Conservation and Recovery Act).

“Record of Decision” or “ROD” shall mean EPA’s Interim Action Record of Decision for the North Hollywood Operable Unit of the San Fernando Valley Area 1 Superfund Site, which was signed on September 30, 2009, by the Regional Administrator, EPA Region IX, or his/her delegate, and all attachments thereto. The ROD is attached as Appendix A.

“Remedial Action” shall mean all activities Settling Defendants are required to perform under the Consent Decree to implement the ROD, in accordance with the SOW, the final Remedial Design and Remedial Action Work Plans, and other plans approved by EPA, including Pre-Achievement O&M and implementation of Institutional Controls, until the Performance Standards are met, and excluding performance of the Remedial Design, Post-Achievement O&M, and the activities required under Section XXIV (Retention of Records).

“Remedial Action Work Plan” shall mean the document developed pursuant to Paragraph 11 and approved by EPA, and any modifications thereto.

“Remedial Design” shall mean those activities to be undertaken by Settling Defendants to develop the final plans and specifications for the Remedial Action pursuant to the Remedial Design Work Plan.

“Remedial Design Work Plan” shall mean the document developed pursuant to Paragraph 10 and approved by EPA, and any modifications thereto.

“Section” shall mean a portion of this Consent Decree identified by a Roman numeral.

“Settling Defendants” shall mean those Parties identified in Appendix D.

“Site” shall mean the San Fernando Valley Area 1 Superfund Site, which includes two operable units (“OUs”), the North Hollywood Operable Unit and the Burbank Operable Unit.

“State” shall mean the State of California.

“Statement of Work” or “SOW” shall mean the statement of work for implementation of the Remedial Design, Remedial Action, and Pre- and Post-Achievement O&M at the NHOU, as set forth in Appendix B to this Consent Decree and any modifications made in accordance with this Consent Decree.

“Supervising Contractor” shall mean the principal contractor retained by Settling Defendants to supervise and direct the implementation of the Work under this Consent Decree.

“Transfer” shall mean to sell, assign, convey, lease, mortgage, or grant a security interest in, or where used as a noun, a sale, assignment, conveyance, or other disposition of any interest by operation of law or otherwise.

“United States” shall mean the United States of America and each department, agency and instrumentality of the United States, including EPA.

“Waste Material” shall mean (1) any “hazardous substance” under Section 101(14) of CERCLA, 42 U.S.C. § 9601(14); (2) any pollutant or contaminant under Section 101(33) of CERCLA, 42 U.S.C. § 9601(33); (3) any “solid waste” under Section 1004(27) of RCRA, 42 U.S.C. § 6903(27); (4) any “hazardous material” under California Health and Safety Code Section 25117; and (5) any “hazardous substance” under California Health and Safety Code Section 25316.

“Work” shall mean all activities and obligations Settling Defendants are required to perform under this Consent Decree, except the activities required under Section XXIV (Retention of Records).

V. GENERAL PROVISIONS

5. Objectives of the Parties. The objectives of the Parties in entering into this Consent Decree are to protect public health or welfare or the environment by the design and implementation of response actions at the NHOU by Settling Defendants, to pay response costs of the Plaintiff, and to resolve the claims of Plaintiff against Settling Defendants as provided in this Consent Decree.

6. Commitments by Settling Defendants.

a. Settling Defendants shall finance and perform the Work in accordance with this Consent Decree, the ROD, the SOW, and all work plans and other plans, standards, specifications, and schedules set forth in this Consent Decree or developed by Settling Defendants and approved by EPA pursuant to this Consent Decree. Settling Defendants shall pay the United States for Past Response Costs, Interim Response Costs, and Future Response Costs as provided in this Consent Decree.

b. The obligations of Settling Defendants to finance and perform the Work, including obligations to pay amounts due under this Consent Decree, are joint and several. In the event of the insolvency of any Settling Defendant or the failure by any Settling Defendant to implement any requirement of this Consent Decree, the remaining Settling Defendants shall complete all such requirements.

7. Compliance with Applicable Law. All activities undertaken by Settling Defendants pursuant to this Consent Decree shall be performed in accordance with the requirements of all applicable federal and state laws and regulations. Settling Defendants must also comply with all applicable or relevant and appropriate requirements of all federal and state environmental laws as set forth in the ROD and the SOW. The activities conducted pursuant to this Consent Decree, if approved by EPA, shall be deemed to be consistent with the NCP.

8. Permits.

a. As provided in Section 121(e) of CERCLA, 42 U.S.C. § 9621(e), and Section 300.400(e) of the NCP, no permit shall be required for any portion of the Work conducted entirely on-site (i.e., within the areal extent of contamination or in very close proximity to the contamination and necessary for implementation of the Work). Where any portion of the Work that is not on-site requires a federal or state permit or approval, Settling Defendants shall submit timely and complete applications and take all other actions necessary to obtain all such permits or approvals.

b. Settling Defendants may seek relief under the provisions of Section XVII (Force Majeure) for any delay in the performance of the Work resulting from a failure to obtain, or a delay in obtaining, any permit or approval referenced in Paragraph 8.a and required for the Work, provided that they have submitted timely and complete applications and taken all other actions necessary to obtain all such permits or approvals.

c. This Consent Decree is not, and shall not be construed to be, a permit issued pursuant to any federal or state statute or regulation.

VI. PERFORMANCE OF THE WORK BY SETTling DEFENDANTS

9. Selection of Supervising Contractor.

a. All aspects of the Work to be performed by Settling Defendants pursuant to Sections VI (Performance of the Work by Settling Defendants), VII (Quality Assurance, Sampling and Data Analysis), XIII (Access and Institutional Controls), and XIV (Emergency Response) shall be under the direction and supervision of the Supervising Contractor, the selection of which shall be subject to disapproval by EPA. Within ten days after the lodging of this Consent Decree, Settling Defendants shall notify EPA in writing of the name, title, and qualifications of any contractor proposed to be the Supervising Contractor. With respect to any contractor proposed to be Supervising Contractor, Settling Defendants shall demonstrate that the proposed contractor has a quality assurance system that complies with ANSI/ASQC E4-1994, "Specifications and Guidelines for Quality Systems for Environmental Data Collection and Environmental Technology Programs" (American National Standard, January 5, 1995), by submitting a copy of the proposed contractor's Quality Management Plan ("QMP"). The QMP should be prepared in accordance with "EPA Requirements for Quality Management Plans (QA/R-2)" (EPA/240/B-01/002, March 2001, reissued May 2006) or equivalent documentation as determined by EPA. EPA will issue a notice of disapproval or an authorization to proceed regarding hiring of the proposed contractor. If at any time thereafter, Settling Defendants propose to change a Supervising Contractor, Settling Defendants shall give such notice to EPA and must obtain an authorization to proceed from EPA before the new Supervising Contractor performs, directs, or supervises any Work under this Consent Decree.

b. If EPA disapproves a proposed Supervising Contractor, EPA will notify Settling Defendants in writing. Settling Defendants shall submit to EPA a list of contractors, including the qualifications of each contractor, that would be acceptable to them within 30 days of receipt of EPA's disapproval of the contractor previously proposed. EPA will provide written notice of the names of any contractor(s) that it disapproves and an authorization to proceed with respect to any of the other contractors. Settling Defendants may select any contractor from that list that is not disapproved and shall notify EPA of the name of the contractor selected within 21 days of EPA's authorization to proceed.

c. If EPA fails to provide written notice of its authorization to proceed or disapproval as provided in this Paragraph and this failure prevents Settling Defendants from meeting one or more deadlines in a plan approved by EPA pursuant to this Consent Decree, Settling Defendants may seek relief under Section XVII (Force Majeure).

10. Remedial Design.

a. Within 30 days after EPA's issuance of an authorization to proceed pursuant to Paragraph 9, Settling Defendants shall submit to EPA and the State a work plan for the design of the Remedial Action at the NHOU ("Remedial Design Work Plan" or "RD Work Plan"). The Remedial Design Work Plan shall provide for design of the remedy set forth in the ROD, in accordance with the SOW and for achievement of the Performance Standards and other requirements set forth in the ROD, this Consent Decree, and/or the SOW. Upon its approval by EPA, the Remedial Design Work Plan shall be incorporated into and enforceable under this Consent Decree.

b. The Remedial Design Work Plan shall include plans and schedules for implementation of all remedial design and pre-design tasks identified in the SOW, including, but not limited to, plans and schedules for the completion of: (1) Health and Safety Plan; (2) sampling and analysis plan; (3) Remedial Design Quality Assurance Project Plan (RD QAPP), in accordance with Section VII (Quality Assurance, Sampling and Data Analysis)); (4) a Groundwater Monitoring Plan; (5) a preliminary design submission; (6) an intermediate design submission; (7) a data evaluation report; and (8) a pre-final/final design submission (if required - see SOW section 2.1.1). In addition, the Remedial Design Work Plan shall include a schedule for completion of the Remedial Action Work Plan. Settling Defendants shall also propose in the Remedial Design Work Plan whether they plan to implement the design and construction utilizing the design/bid/build or design/build process for EPA's approval (see section 2.1.1 of the SOW).

c. Upon approval of the Remedial Design Work Plan by EPA, after a reasonable opportunity for review and comment by the State, and submission of the Health and Safety Plan for all field activities to EPA and the State, Settling Defendants shall implement the Remedial Design Work Plan. Settling Defendants shall submit to EPA and the State all plans, reports, and other deliverables required under the approved Remedial Design Work Plan in accordance with the approved schedule for review and approval pursuant to Section X (EPA Approval of Plans and Other Submissions). Unless otherwise directed by EPA, Settling Defendants shall not commence further Remedial Design activities at the NHOU prior to approval of the Remedial Design Work Plan.

d. The preliminary design submission shall include, at a minimum, the following: (1) design criteria; (2) results of additional field sampling and pre-design work; (3) project delivery strategy; (4) preliminary plans, drawings and sketches; (5) required specifications in outline form; and (6) preliminary construction schedule.

e. The intermediate design submission shall be a continuation and expansion of the preliminary design.

f. The pre-final/final design submission shall include, at a minimum, the following: (1) final plans and specifications (if the Design/Bid/Build process is approved; not required for the Design/Build process); (2) Construction Quality Assurance Project Plan ("CQAPP"); (3) Field Sampling Plan (directed at measuring progress towards meeting Performance Standards); and (4) Contingency Plan. The CQAPP, which shall detail the approach to quality assurance during construction activities at the NHOU, shall specify a quality

assurance official, independent of the Supervising Contractor, to conduct a quality assurance program during the construction phase of the project.

11. Remedial Action.

a. Within 90 days after the approval of the intermediate design submission, Settling Defendants shall submit to EPA and the State a work plan for the performance of the Remedial Action at the NHOU ("Remedial Action Work Plan"). The Remedial Action Work Plan shall provide for construction and implementation of the remedy set forth in the ROD and achievement of the Performance Standards, in accordance with this Consent Decree, the ROD, the SOW, and the design plans and specifications developed in accordance with the Remedial Design Work Plan and approved by EPA. Upon its approval by EPA, the Remedial Action Work Plan shall be incorporated into and enforceable under this Consent Decree. At the same time as they submit the Remedial Action Work Plan, Settling Defendants shall submit to EPA a Pre-Achievement O&M Plan and to both EPA and the State a Health and Safety Plan for field activities required by the Remedial Action Work Plan which conforms to the applicable Occupational Safety and Health Administration and EPA requirements including, but not limited to, 29 CFR § 1910.120.

b. The Remedial Action Work Plan shall include the following: (1) schedule for completion of the Remedial Action, including a schedule for completion of physical construction of the remedy as approved pursuant to Paragraph 10; (2) method for selection of the contractor; (3) schedule for developing and submitting other required Remedial Action plans; (4) groundwater monitoring plan; (5) methods for satisfying permitting requirements; (6) methodology for implementing the Pre-Achievement O&M Plan; (7) methodology for implementing the Contingency Plan; (8) tentative formulation of the Remedial Action team; (9) Construction Quality Assurance Plan (by construction contractor); and (10) procedures and plans for the decontamination of equipment and the disposal of contaminated materials. The Remedial Action Work Plan also shall include the methodology for implementing the Construction Quality Assurance Plan and a schedule for implementing all Remedial Action tasks identified in the final design submission and shall identify the initial formulation of Settling Defendants' Remedial Action project team (including, but not limited to, the Supervising Contractor).

c. Upon approval of the Remedial Action Work Plan by EPA, after a reasonable opportunity for review and comment by the State, Settling Defendants shall implement the activities required under the Remedial Action Work Plan. Settling Defendants shall submit to EPA and the State all reports and other deliverables required under the approved Remedial Action Work Plan in accordance with the approved schedule for review and approval pursuant to Section X (EPA Approval of Plans and Other Submissions). Unless otherwise directed by EPA, Settling Defendants shall not commence physical Remedial Action activities at the NHOU prior to approval of the Remedial Action Work Plan.

d. Upon completion of physical construction of the remedy, Settling Defendants shall submit a report for EPA's review and approval documenting completion of construction.

e. No fewer than 30 days prior to the pre-certification inspection conducted pursuant to Section XIII, Settling Defendants shall submit to EPA a Post-Achievement O&M Plan. The Post-Achievement O&M Plan shall set forth all activities necessary to maintain the

effectiveness of the Remedial Action and ensure continued achievement of Performance Standards after the Remedial Action has been implemented. The Post-Achievement O&M Plan shall be consistent with this Consent Decree, the ROD, and the SOW. Upon its approval by EPA, the Post-Achievement O&M Plan shall be incorporated into and enforceable under this Consent Decree.

12. Settling Defendants shall continue to implement the Remedial Action until the Performance Standards are achieved. Once Performance Standards have been achieved, Settling Defendants shall continue to conduct the Work, including implementation of the Post-Achievement O&M Plan until EPA determines that the Work has been completed.

13. Modification of SOW or Related Work Plans.

a. If EPA determines that it is necessary to modify the work specified in the SOW and/or in work plans developed pursuant to the SOW to achieve and maintain the Performance Standards or to carry out and maintain the effectiveness of the remedy set forth in the ROD, and such modification is consistent with the scope of the remedy set forth in the ROD, then EPA may issue such modification in writing and shall notify Settling Defendants of such modification. For the purposes of this Paragraph and Paragraph 44 (Completion of the Work) only, the “scope of the remedy set forth in the ROD” is: (1) meeting all Performance Standards identified in Section 2.13.2 of the ROD (including Table 6); (2) meeting all Remedial Action Objectives identified in Section 2.8 of the ROD; and (3) meeting all drinking water standards necessary to satisfy the end-use selected in the ROD, which is delivery of treated water to LADWP for use in its domestic water supply system. If Settling Defendants object to the modification they may, within 30 days after EPA’s notification, seek dispute resolution under Paragraph 62 (Record Review).

b. The SOW and/or related work plans shall be modified: (i) in accordance with the modification issued by EPA; or (ii) if Settling Defendants invoke dispute resolution, in accordance with the final resolution of the dispute. The modification shall be incorporated into and enforceable under this Consent Decree, and Settling Defendants shall implement all work required by such modification. Settling Defendants shall incorporate the modification into the Remedial Design or Remedial Action Work Plan under Paragraph 10 or 11, as appropriate.

c. Nothing in this Paragraph shall be construed to limit EPA’s authority to require performance of further response actions as otherwise provided in this Consent Decree.

14. Nothing in this Consent Decree, the SOW, or the Remedial Design or Remedial Action Work Plans constitutes a warranty or representation of any kind by Plaintiff that compliance with the work requirements set forth in the SOW and the Work Plans will achieve the Performance Standards.

15. Off-Site Shipment of Waste Material.

a. Settling Defendants may ship Waste Material from the NHOU to an off-site facility only if they verify, prior to any shipment, that the off-site facility is operating in compliance with the requirements of Section 121(d)(3) of CERCLA, 42 U.S.C. § 9621(d)(3), and 40 CFR § 300.440, by obtaining a determination from EPA that the proposed receiving facility is operating in compliance with 42 U.S.C. § 9621(d)(3) and 40 CFR § 300.440.

b. Settling Defendants may ship Waste Material from the NHOU to an out-of-state waste management facility only if, prior to any shipment, they provide written notice to the appropriate state environmental official in the receiving facility's state and to the EPA Project Coordinator. This notice requirement shall not apply to any off-site shipments when the total quantity of all such shipments will not exceed ten cubic yards. The written notice shall include the following information, if available: (i) the name and location of the receiving facility; (ii) the type and quantity of Waste Material to be shipped; (iii) the schedule for the shipment; and (iv) the method of transportation. Settling Defendants also shall notify the state environmental official referenced above and the EPA Project Coordinator of any major changes in the shipment plan, such as a decision to ship the Waste Material to a different out-of-state facility. Settling Defendants shall provide the written notice after the award of the contract for Remedial Action construction and before the Waste Material is shipped.

VII. QUALITY ASSURANCE, SAMPLING, AND DATA ANALYSIS

16. Quality Assurance.

a. Settling Defendants shall use quality assurance, quality control, and chain of custody procedures for all design, compliance, and monitoring samples in accordance with "EPA Requirements for Quality Assurance Project Plans (QA/R5)" (EPA/240/B-01/003, March 2001, reissued May 2006), "Guidance for Quality Assurance Project Plans (QA/G-5)" (EPA/240/R-02/009, December 2002), and subsequent amendments to such guidelines upon notification by EPA to Settling Defendants of such amendment. Amended guidelines shall apply only to procedures conducted after such notification.

b. Prior to the commencement of any monitoring project under this Consent Decree, Settling Defendants shall submit to EPA for approval, after a reasonable opportunity for review and comment by the State, a Quality Assurance Project Plan ("QAPP") that is consistent with the SOW, the NCP, and applicable guidance documents, as specified in Attachment 3 to the SOW. If relevant to the proceeding, the Parties agree that validated sampling data generated in accordance with the QAPP(s) and reviewed and approved by EPA shall be admissible as evidence, without objection, in any proceeding under this Consent Decree. Settling Defendants shall ensure that EPA personnel and its authorized representatives are allowed access at reasonable times to all laboratories utilized by Settling Defendants in implementing this Consent Decree. In addition, Settling Defendants shall ensure that such laboratories shall analyze all samples submitted by EPA pursuant to the QAPP for quality assurance monitoring. Settling Defendants shall ensure that the laboratories they utilize for the analysis of samples taken pursuant to this Consent Decree perform all analyses according to accepted EPA methods. Accepted EPA methods consist of those methods that are documented in the "USEPA Contract Laboratory Program Statement of Work for Inorganic Analysis, ILM05.4," and the "USEPA Contract Laboratory Program Statement of Work for Organic Analysis, SOM01.2," and any amendments made thereto during the course of the implementation of this Decree; however, upon approval by EPA, after opportunity for review and comment by the State, Settling Defendants may use other analytical methods which are as stringent as or more stringent than the CLP-approved methods. Settling Defendants shall ensure that all laboratories they use for analysis of samples taken pursuant to this Consent Decree participate in an EPA or EPA-equivalent QA/QC program. Settling Defendants shall use only laboratories that have a documented Quality System which complies with ANSI/ASQC E4-1994, "Specifications and

Guidelines for Quality Systems for Environmental Data Collection and Environmental Technology Programs” (American National Standard, January 5, 1995), and “EPA Requirements for Quality Management Plans (QA/R-2)” (EPA/240/B-01/002, March 2001, reissued May 2006) or equivalent documentation as determined by EPA. EPA may consider laboratories accredited under the National Environmental Laboratory Accreditation Program (“NELAP”) as meeting the Quality System requirements. Settling Defendants shall ensure that all field methodologies utilized in collecting samples for subsequent analysis pursuant to this Consent Decree are conducted in accordance with the procedures set forth in the QAPP approved by EPA.

17. Upon request, Settling Defendants shall allow split or duplicate samples to be taken by EPA or their authorized representatives. Settling Defendants shall notify EPA not less than 28 days in advance of any sample collection activity unless shorter notice is agreed to by EPA. In addition, EPA shall have the right to take any additional samples that EPA deems necessary. Upon request, EPA shall allow Settling Defendants to take split or duplicate samples of any samples it takes as part of Plaintiff’s oversight of Settling Defendants’ implementation of the Work.

18. Settling Defendants shall, as specified in Attachment 2 to the SOW, submit to EPA copies of the results of all sampling and/or tests or other data obtained or generated by or on behalf of Settling Defendants with respect to the NHOU and/or the implementation of this Consent Decree unless EPA agrees otherwise.

19. Notwithstanding any provision of this Consent Decree, the United States retains all of its information gathering and inspection authorities and rights, including enforcement actions related thereto, under CERCLA, RCRA, and any other applicable statutes or regulations.

VIII. ACCESS AND INSTITUTIONAL CONTROLS

20. If any real property where access or land/water use restrictions are needed, is owned or controlled by any of Settling Defendants:

a. such Settling Defendants shall, commencing on the date of lodging of the Consent Decree, provide the United States and the other Settling Defendants, and their representatives, contractors, and subcontractors, with access at all reasonable times to conduct any activity regarding the Consent Decree including, but not limited to, the following activities:

1. Monitoring the Work;
2. Verifying any data or information submitted to the United States;
3. Conducting investigations regarding contamination at or near the NHOU;
4. Obtaining samples;
5. Assessing the need for, planning, or implementing additional response actions at or near the NHOU;
6. Assessing implementation of quality assurance and quality control practices as defined in the approved Quality Assurance Project Plans;

7. Implementing the Work pursuant to the conditions set forth in Paragraph 82 (Work Takeover);
8. Inspecting and copying records, operating logs, contracts, or other documents maintained or generated by Settling Defendants or their agents, consistent with Section XXIII (Access to Information);
9. Assessing Settling Defendants' compliance with the Consent Decree;
10. Determining whether the NHOU or other real property is being used in a manner that is prohibited or restricted, or that may need to be prohibited or restricted under the Consent Decree; and
11. Implementing, monitoring, maintaining, reporting on, and enforcing any Institutional Controls and the requirements of the ICIAP.

b. commencing on the date of lodging of the Consent Decree, such Settling Defendants shall not use real property that they own or control, in any manner that EPA determines will pose an unacceptable risk to human health or to the environment due to exposure to Waste Materials or interfere with or adversely affect the implementation, integrity, or protectiveness of the Remedial Action. The restrictions shall include, but not be limited to: installation of drinking water wells.

21. If any real property where access and/or land/water use restrictions are needed, is owned or controlled by persons other than any Settling Defendant, Settling Defendants shall use best efforts to secure from such persons:

a. an agreement to provide access thereto for the United States and Settling Defendants, and their representatives, contractors and subcontractors, to conduct any activity regarding the Consent Decree including, but not limited to, the activities listed in Paragraph 20.a; and

b. an agreement, enforceable by Settling Defendants and the United States, to refrain from using the real property owned or controlled by such persons, in any manner that EPA determines will pose an unacceptable risk to human health or to the environment due to exposure to Waste Materials or interfere with or adversely affect the implementation, integrity, or protectiveness of the Remedial Action. The agreement shall include, but not be limited to, the land/water use restrictions listed in Paragraph 20.b.

22. For purposes of Paragraphs 20 and 21, "best efforts" includes the payment of reasonable sums of money to obtain access, an agreement to restrict land/water use, a Proprietary Control, and/or an agreement to release or subordinate a prior lien or encumbrance. If, within 30 days of EPA's approval of the ICIAP, Settling Defendants have not obtained agreements to provide access or restrict land/water use as required by Paragraph 21.a and 21.b, Settling Defendants shall promptly notify the United States in writing, and shall include in that notification a summary of the steps that Settling Defendants have taken to attempt to comply with Paragraph 20 or 21. The United States may, as it deems appropriate, assist Settling Defendants in obtaining access or agreements to restrict land/water use. Settling Defendants shall reimburse the United States under Section XV (Payments for Response Costs), for all costs

incurred, direct or indirect, by the United States in obtaining such access or agreements to restrict land/water use, including, but not limited to, the cost of attorney time and the amount of monetary consideration paid or just compensation.

23. If EPA determines that Institutional Controls in the form of state or local laws, regulations, ordinances, zoning restrictions, or other governmental controls are needed, Settling Defendants shall cooperate with EPA's efforts to secure and ensure compliance with such governmental controls.

24. Notwithstanding any provision of the Consent Decree, the United States retains all of its access authorities and rights, as well as all of its rights to require Institutional Controls, including enforcement authorities related thereto, under CERCLA, RCRA, and any other applicable statute or regulations.

IX. REPORTING REQUIREMENTS

25. In addition to any other requirement of this Consent Decree, Settling Defendants shall, as specified in Attachment 2 to the SOW, submit to EPA and the State two copies of written monthly progress reports that: (a) describe the actions which have been taken toward achieving compliance with this Consent Decree during the previous month; (b) include a summary of all results of sampling and tests and all other data received or generated by Settling Defendants or their contractors or agents in the previous month; (c) identify all plans, reports, and other deliverables required by this Consent Decree completed and submitted during the previous month; (d) describe all actions, including, but not limited to, data collection and implementation of work plans, which are scheduled for the next six weeks and provide other information relating to the progress of construction, including, but not limited to, critical path diagrams, Gantt charts and Pert charts; (e) include information regarding percentage of completion, unresolved delays encountered or anticipated that may affect the future schedule for implementation of the Work, and a description of efforts made to mitigate those delays or anticipated delays; (f) include any modifications to the work plans or other schedules that Settling Defendants have proposed to EPA or that have been approved by EPA; and (g) describe all activities undertaken in support of the Community Relations Plan during the previous month and those to be undertaken in the next six weeks. Settling Defendants shall submit these progress reports to EPA and the State by the tenth day of every month following the lodging of this Consent Decree until EPA notifies Settling Defendants pursuant to Paragraph 44.b of Section XIV (Certification of Completion). If requested by EPA, Settling Defendants shall also provide briefings for EPA to discuss the progress of the Work.

26. Settling Defendants shall notify EPA of any change in the schedule described in the monthly progress report for the performance of any activity, including, but not limited to, data collection and implementation of work plans, no later than seven days prior to the performance of the activity.

27. Upon the occurrence of any event during performance of the Work that Settling Defendants are required to report pursuant to Section 103 of CERCLA, 42 U.S.C. § 9603, or Section 304 of the Emergency Planning and Community Right-to-know Act ("EPCRA"), 42 U.S.C. § 11004, Settling Defendants shall within 24 hours of the onset of such event orally notify the EPA Project Coordinator or the Alternate EPA Project Coordinator (in the event of the unavailability of the EPA Project Coordinator), or, in the event that neither the EPA Project

Coordinator or Alternate EPA Project Coordinator is available, the Emergency Response Section, Region IX, United States Environmental Protection Agency at (800) 300-2193. These reporting requirements are in addition to the reporting required by CERCLA Section 103 or EPCRA Section 304.

28. Within 20 days of the onset of such an event, Settling Defendants shall furnish to EPA a written report, signed by Settling Defendants' Project Coordinator, setting forth the events that occurred and the measures taken, and to be taken, in response thereto. Within 30 days of the conclusion of such an event, Settling Defendants shall submit a report setting forth all actions taken in response thereto.

29. Settling Defendants shall submit one hard copy and one electronic copy of all plans, reports, data, and other deliverables required by the SOW, the Remedial Design Work Plan, the Remedial Action Work Plan, or any other approved plans to EPA in accordance with the schedules set forth in such plans. Settling Defendants shall simultaneously submit one hard copy of all such plans, reports, data, and other deliverables to the State, LADWP, and EPA's contractor. Upon request by EPA, Settling Defendants shall submit in electronic form all or any portion of any deliverables Settling Defendants are required to submit pursuant to the provisions of this Consent Decree.

30. All deliverables submitted by Settling Defendants to EPA which purport to document Settling Defendants' compliance with the terms of this Consent Decree shall be signed by an authorized representative of Settling Defendants.

X. EPA APPROVAL OF PLANS, REPORTS, AND OTHER DELIVERABLES

31. Initial Submissions.

a. After review of any plan, report, or other deliverable that is required to be submitted for approval pursuant to this Consent Decree, EPA, after reasonable opportunity for review and comment by the State, shall: (i) approve, in whole or in part, the submission; (ii) approve the submission upon specified conditions; (iii) disapprove, in whole or in part, the submission; or (iv) any combination of the foregoing.

b. EPA also may modify the initial submission to cure deficiencies in the submission if: (i) EPA determines that disapproving the submission and awaiting a resubmission would cause substantial disruption to the Work; or (ii) previous submission(s) have been disapproved due to material defects and the deficiencies in the initial submission under consideration indicate a bad faith lack of effort to submit an acceptable plan, report, or deliverable.

32. **Resubmissions.** Upon receipt of a notice of disapproval under Paragraph 31.a.(iii) or (iv), or if required by a notice of approval upon specified conditions under Paragraph 31.a.(ii), Settling Defendants shall, within 15 days or such longer time as specified by EPA in such notice, correct the deficiencies and resubmit the plan, report, or other deliverable for approval. After review of the resubmitted plan, report, or other deliverable, EPA may: (a) approve, in whole or in part, the resubmission; (b) approve the resubmission upon specified conditions; (c) modify the resubmission; (d) disapprove, in whole or in part, the resubmission, requiring Settling Defendants to correct the deficiencies; or (e) any combination of the foregoing.

33. Material Defects. If an initially submitted or resubmitted plan, report, or other deliverable contains a material defect, and the plan, report, or other deliverable is disapproved or modified by EPA under Paragraph 31.b.(ii) or 32 due to such material defect, then the material defect shall constitute a lack of compliance for purposes of Paragraph 65. The provisions of Section XVIII (Dispute Resolution) and Section XIX (Stipulated Penalties) shall govern the accrual and payment of any stipulated penalties regarding Settling Defendants' submissions under this Section.

34. Implementation. Upon approval, approval upon conditions, or modification by EPA under Paragraph 31 or 32, of any plan, report, or other deliverable, or any portion thereof: (a) such plan, report, or other deliverable, or portion thereof, shall be incorporated into and enforceable under this Consent Decree; and (b) Settling Defendants shall take any action required by such plan, report, or other deliverable, or portion thereof, subject only to their right to invoke the Dispute Resolution procedures set forth in Section XVIII (Dispute Resolution) with respect to the modifications or conditions made by EPA. The implementation of any non-deficient portion of a plan, report, or other deliverable submitted or resubmitted under Paragraph 31 or 32 shall not relieve Settling Defendants of any liability for stipulated penalties under Section XIX (Stipulated Penalties).

XI. PROJECT COORDINATORS

35. Within 20 days of lodging this Consent Decree, Settling Defendants and EPA will notify each other, in writing, of the name, address, and telephone number of their respective designated Project Coordinators and Alternate Project Coordinators. If a Project Coordinator or Alternate Project Coordinator initially designated is changed, the identity of the successor will be given to the other Parties at least five working days before the change occurs, unless impracticable, but in no event later than the actual day the change is made. Settling Defendants' Project Coordinator shall be subject to disapproval by EPA and shall have the technical expertise sufficient to adequately oversee all aspects of the Work. Settling Defendants' Project Coordinator shall not be an attorney for any Settling Defendant in this matter. He or she may assign other representatives, including other contractors, to serve as a representative for oversight of performance of daily operations during remedial activities.

36. Plaintiffs may designate other representatives, including, but not limited to, EPA employees, and federal contractors and consultants, to observe and monitor the progress of any activity undertaken pursuant to this Consent Decree. EPA's Project Coordinator and Alternate Project Coordinator shall have the authority lawfully vested in a Remedial Project Manager (RPM) and an On-Scene Coordinator (OSC) by the NCP, 40 CFR Part 300. EPA's Project Coordinator or Alternate Project Coordinator shall have authority, consistent with the NCP, to halt any Work required by this Consent Decree and to take any necessary response action when he or she determines that conditions at the NHOU constitute an emergency situation or may present an immediate threat to public health or welfare or the environment due to release or threatened release of Waste Material.

37. EPA's Project Coordinator and Settling Defendants' Project Coordinator will meet, at a minimum, on a monthly basis.

XII. PERFORMANCE GUARANTEE

38. In order to ensure the full and final completion of the Work, Settling Defendants shall establish and maintain a performance guarantee, initially in the amount of \$108,000,000, for the benefit of EPA (hereinafter “Estimated Cost of the Work”). The performance guarantee, which must be satisfactory in form and substance to EPA, shall be in the form of one or more of the following mechanisms (provided that, if Settling Defendants intend to use multiple mechanisms, such multiple mechanisms shall be limited to surety bonds guaranteeing payment, letters of credit, trust funds, and insurance policies):

a. A surety bond unconditionally guaranteeing payment and/or performance of the Work that is issued by a surety company among those listed as acceptable sureties on federal bonds as set forth in Circular 570 of the U.S. Department of the Treasury;

b. One or more irrevocable letters of credit, payable to or at the direction of EPA, that is issued by one or more financial institution(s) (i) that has the authority to issue letters of credit and (ii) whose letter-of-credit operations are regulated and examined by a federal or state agency;

c. A trust fund established for the benefit of EPA that is administered by a trustee (i) that has the authority to act as a trustee and (ii) whose trust operations are regulated and examined by a federal or state agency;

d. A policy of insurance that (i) provides EPA with acceptable rights as a beneficiary thereof; and (ii) is issued by an insurance carrier (a) that has the authority to issue insurance policies in the applicable jurisdiction(s) and (b) whose insurance operations are regulated and examined by a federal or state agency;

e. A demonstration by one or more Settling Defendants that each such Settling Defendant meets the financial test criteria of 40 CFR § 264.143(f) with respect to the Estimated Cost of the Work (plus the amount(s) of any other federal or any state environmental obligations financially assured through the use of a financial test or guarantee), provided that all other requirements of 40 CFR § 264.143(f) are met to EPA’s satisfaction; or

f. A written guarantee to fund or perform the Work executed in favor of EPA by one or more of the following: (i) a direct or indirect parent company of a Settling Defendant, or (ii) a company that has a “substantial business relationship” (as defined in 40 CFR § 264.141(h)) with at least one Settling Defendant; provided, however, that any company providing such a guarantee must demonstrate to the satisfaction of EPA that it satisfies the financial test and reporting requirements for owners and operators set forth in subparagraphs (1) through (8) of 40 CFR § 264.143(f) with respect to the Estimated Cost of the Work (plus the amount(s) of any other federal or any state environmental obligations financially assured through the use of a financial test or guarantee) that it proposes to guarantee hereunder.

39. Settling Defendants have selected, and EPA has found satisfactory, as an initial performance guarantee pursuant to Paragraph 38., in the form attached hereto as Appendix E. Within ten days after the Effective Date, Settling Defendants shall execute or otherwise finalize all instruments or other documents required in order to make the selected performance guarantee(s) legally binding in a form substantially identical to the documents attached hereto as Appendix E, and such performance guarantee(s) shall thereupon be fully effective. Within 30

days of the Effective Date, Settling Defendants shall submit copies of all executed and/or otherwise finalized instruments or other documents required in order to make the selected performance guarantee(s) legally binding to the United States and EPA (including EPA's Regional Financial Management Officer) as specified in Section XXV (Notices and Submissions).

40. If, at any time after the Effective Date and before issuance of the Certification of Completion of the Work pursuant to Paragraph 44, Settling Defendants provide a performance guarantee for completion of the Work by means of a demonstration or guarantee pursuant to Paragraph 38.e or 38.f, the relevant Settling Defendants shall also comply with the other relevant requirements of 40 CFR § 264.143(f) relating to these mechanisms unless otherwise provided in this Consent Decree, including but not limited to: (a) the initial submission of required financial reports and statements from the relevant entity's chief financial officer ("CFO") and independent certified public accountant ("CPA"), in the form prescribed by EPA in its financial test sample CFO letters and CPA reports available at: <http://www.epa.gov/compliance/resources/policies/cleanup/superfund/fa-test-samples.pdf>; (b) the annual re-submission of such reports and statements within 90 days after the close of each such entity's fiscal year; and (c) the prompt notification of EPA after each such entity determines that it no longer satisfies the financial test requirements set forth at 40 CFR § 264.143(f)(1) and in any event within 90 days after the close of any fiscal year in which such entity no longer satisfies such financial test requirements. For purposes of the performance guarantee mechanisms specified in this Section XII, references in 40 CFR Part 264, Subpart H, to "closure," "post-closure," and "plugging and abandonment" shall be deemed to include the Work; the terms "current closure cost estimate," "current post-closure cost estimate," and "current plugging and abandonment cost estimate" shall be deemed to include the Estimated Cost of the Work; the terms "owner" and "operator" shall be deemed to refer to each Settling Defendant making a demonstration under Paragraph 38.e; and the terms "facility" and "hazardous waste facility" shall be deemed to include the NHO.

41. In the event that EPA determines at any time that a performance guarantee provided by any Settling Defendant pursuant to this Section is inadequate or otherwise no longer satisfies the requirements set forth in this Section, whether due to an increase in the estimated cost of completing the Work or for any other reason, or in the event that any Settling Defendant becomes aware of information indicating that a performance guarantee provided pursuant to this Section is inadequate or otherwise no longer satisfies the requirements set forth in this Section, whether due to an increase in the estimated cost of completing the Work or for any other reason, Settling Defendants, within 30 days of receipt of notice of EPA's determination or, as the case may be, within 30 days of any Settling Defendant becoming aware of such information, shall obtain and present to EPA for approval a proposal for a revised or alternative form of performance guarantee listed in Paragraph 38 that satisfies all requirements set forth in this Section XII; provided, however, that if any Settling Defendant cannot obtain such revised or alternative form of performance guarantee within such 30-day period, and provided further that the Settling Defendant shall have commenced to obtain such revised or alternative form of performance guarantee within such 30-day period, and thereafter diligently proceeds to obtain the same, EPA shall extend such period for such time as is reasonably necessary for the Settling Defendant in the exercise of due diligence to obtain such revised or alternative form of performance guarantee, such additional period not to exceed 30 days. In seeking approval for a revised or alternative form of performance guarantee, Settling Defendants shall follow the

procedures set forth in Paragraph 43.(b).(2). Settling Defendants' inability to post a performance guarantee for completion of the Work shall in no way excuse performance of any other requirements of this Consent Decree, including, without limitation, the obligation of Settling Defendants to complete the Work in strict accordance with the terms of this Consent Decree.

42. Funding for Work Takeover. The commencement of any Work Takeover pursuant to Paragraph 82 shall trigger EPA's right to receive the benefit of any performance guarantee(s) provided pursuant to Paragraphs 38.a, 38.b, 38.c, 38.d, or 38.f, and at such time EPA shall have immediate access to resources guaranteed under any such performance guarantee(s), whether in cash or in kind, as needed to continue and complete the Work assumed by EPA under the Work Takeover. Upon the commencement of any Work Takeover, if (a) for any reason EPA is unable to promptly secure the resources guaranteed under any such performance guarantee(s), whether in cash or in kind, necessary to continue and complete the Work assumed by EPA under the Work Takeover, or (b) in the event that the performance guarantee involves a demonstration of satisfaction of the financial test criteria pursuant to Paragraph 38.e or Paragraph 38.f.(ii), Settling Defendants (or in the case of Paragraph 38.f.(ii), the guarantor) shall immediately upon written demand from EPA deposit into a special account within the EPA Hazardous Substance Superfund or such other account as EPA may specify, in immediately available funds and without setoff, counterclaim, or condition of any kind, a cash amount up to but not exceeding the estimated cost of completing the Work as of such date, as determined by EPA. In addition, if at any time EPA is notified by the issuer of a performance guarantee that such issuer intends to cancel the performance guarantee mechanism it has issued, then, unless Settling Defendants provide a substitute performance guarantee mechanism in accordance with this Section XIII no later than 30 days prior to the impending cancellation date, EPA shall be entitled (as of and after the date that is 30 days prior to the impending cancellation) to draw fully on the funds guaranteed under the then-existing performance guarantee. All EPA Work Takeover costs not reimbursed under this Paragraph shall be reimbursed under Section XVI (Payments for Response Costs).

43. Modification of Amount and/or Form of Performance Guarantee.

a. Reduction of Amount of Performance Guarantee. If Settling Defendants believe that the estimated cost of completing the Work has diminished below the amount set forth in Paragraph 38, Settling Defendants may, on any anniversary of the Effective Date, or at any other time agreed to by the Parties, petition EPA in writing to request a reduction in the amount of the performance guarantee provided pursuant to this Section so that the amount of the performance guarantee is equal to the estimated cost of completing the Work. Settling Defendants shall submit a written proposal for such reduction to EPA that shall specify, at a minimum, the estimated cost of completing the Work and the basis upon which such cost was calculated. In seeking approval for a reduction in the amount of the performance guarantee, Settling Defendants shall follow the procedures set forth in Paragraph 43.b.(2) for requesting a revised or alternative form of performance guarantee, except as specifically provided in this Paragraph 43.a. If EPA decides to accept Settling Defendants' proposal for a reduction in the amount of the performance guarantee, either to the amount set forth in Settling Defendants' written proposal or to some other amount as selected by EPA, EPA will notify the petitioning Settling Defendants of such decision in writing. Upon EPA's acceptance of a reduction in the amount of the performance guarantee, the Estimated Cost of the Work shall be deemed to be the

estimated cost of completing the Work set forth in EPA's written decision. After receiving EPA's written decision, Settling Defendants may reduce the amount of the performance guarantee in accordance with and to the extent permitted by such written acceptance and shall submit copies of all executed and/or otherwise finalized instruments or other documents required in order to make the selected performance guarantee(s) legally binding in accordance with Paragraph 43.b.(2). In the event of a dispute, Settling Defendants may reduce the amount of the performance guarantee required hereunder only in accordance with a final administrative or judicial decision resolving such dispute pursuant to Section XVIII (Dispute Resolution). No change to the form or terms of any performance guarantee provided under this Section, other than a reduction in amount, is authorized except as provided in Paragraphs 41 or 43.b.

b. Change of Form of Performance Guarantee.

1. If, after the Effective Date, Settling Defendants desire to change the form or terms of any performance guarantee(s) provided pursuant to this Section, Settling Defendants may, on any anniversary of the Effective Date, or at any other time agreed to by the Parties, petition EPA in writing to request a change in the form or terms of the performance guarantee provided hereunder. The submission of such proposed revised or alternative performance guarantee shall be as provided in Paragraph 43.b.(2). Any decision made by EPA on a petition submitted under this Paragraph shall be made in EPA's sole and unreviewable discretion, and such decision shall not be subject to challenge by Settling Defendants pursuant to the dispute resolution provisions of this Consent Decree or in any other forum.

2. Settling Defendants shall submit a written proposal for a revised or alternative performance guarantee to EPA which shall specify, at a minimum, the estimated cost of completing the Work, the basis upon which such cost was calculated, and the proposed revised performance guarantee, including all proposed instruments or other documents required in order to make the proposed performance guarantee legally binding. The proposed revised or alternative performance guarantee must satisfy all requirements set forth or incorporated by reference in this Section. Settling Defendants shall submit such proposed revised or alternative performance guarantee to EPA (both the Project Coordinator and the Regional Financial Management Officer) in accordance with Section XXV (Notices and Submissions). EPA will notify Settling Defendants in writing of its decision to accept or reject a revised or alternative performance guarantee submitted pursuant to this Paragraph. Within ten days after receiving a written decision approving the proposed revised or alternative performance guarantee, Settling Defendants shall execute and/or otherwise finalize all instruments or other documents required in order to make the selected performance guarantee(s) legally binding in a form substantially identical to the documents submitted to EPA as part of the proposal, and such performance guarantee(s) shall thereupon be fully effective. Settling Defendants shall submit copies of all executed and/or otherwise finalized instruments or other documents required in order to make the selected performance guarantee(s) legally binding to EPA (both the Project Coordinator and the Regional Financial Management Officer) and to the United States within 30 days of receiving a written decision approving the proposed revised or alternative performance guarantee in accordance with Section XXV (Notices and Submissions).

c. Release of Performance Guarantee. Settling Defendants shall not release, cancel, or discontinue any performance guarantee provided pursuant to this Section except as provided in this Paragraph. If Settling Defendants receive written notice from EPA in

accordance with Paragraph 44 that the Work has been fully and finally completed in accordance with the terms of this Consent Decree, or if EPA otherwise so notifies Settling Defendants in writing, Settling Defendants may thereafter release, cancel, or discontinue the performance guarantee(s) provided pursuant to this Section. In the event of a dispute, Settling Defendants may release, cancel, or discontinue the performance guarantee(s) required hereunder only in accordance with a final administrative or judicial decision resolving such dispute pursuant to Section XVIII (Dispute Resolution).

XIII. CERTIFICATION OF COMPLETION

44. Completion of the Remedial Action.

a. Within 90 days after EPA determines, pursuant to Paragraph 11.d, that physical contraction of the remedy is complete, Settling Defendants shall schedule and conduct a pre-certification inspection to be attended by Settling Defendants and EPA to demonstrate that the remedial action has been fully performed. If, after the pre-certification inspection, Settling Defendants still believe that the Remedial Action has been fully performed, Settling Defendants shall submit a written report by a registered professional engineer stating that the Remedial Action has been completed in full satisfaction of the requirements of this Consent Decree. The report shall contain the following statement, signed by a responsible corporate official of a Settling Defendant or Settling Defendants' Project Coordinator:

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

If, after review of the written report, EPA, after reasonable opportunity for review and comment by the State, determines that any portion of the Remedial Action has not been completed in accordance with this Consent Decree, EPA will notify Settling Defendants in writing of the activities that must be undertaken by Settling Defendants pursuant to this Consent Decree to complete the Remedial Action, provided, however, that EPA may only require Settling Defendants to perform such activities pursuant to this Paragraph to the extent that such activities are consistent with the "scope of the remedy set forth in the ROD," as that term is defined in Paragraph 13.a. EPA will set forth in the notice a schedule for performance of such activities consistent with the Consent Decree and the SOW or require Settling Defendants to submit a schedule to EPA for approval pursuant to Section X (EPA Approval of Plans and Other Submissions). Settling Defendants shall perform all activities described in the notice in accordance with the specifications and schedules established therein, subject to their right to invoke the dispute resolution procedures set forth in Section XVIII (Dispute Resolution).

b. If EPA concludes, based on the initial or any subsequent request for Certification of Completion of the Remedial Action by Settling Defendants and after a

reasonable opportunity for review and comment by the State, that the Remedial Action has been performed in accordance with this Consent Decree, EPA will so notify Settling Defendants in writing.

XIV. EMERGENCY RESPONSE

45. If any action or occurrence during the performance of the Work causes or threatens a release of Waste Material at the NHOU that constitutes an emergency situation or may present an immediate threat to public health or welfare or the environment, Settling Defendants shall, subject to Paragraph 46, immediately take all appropriate action to prevent, abate, or minimize such release or threat of release, and shall immediately notify the EPA's Project Coordinator, or, if the Project Coordinator is unavailable, EPA's Alternate Project Coordinator. If neither of these persons is available, Settling Defendants shall notify the Duty Officer in EPA Region IX's Emergency Response, Preparedness, and Prevention Branch, at (800) 300-2193. Settling Defendants shall take such actions in consultation with EPA's Project Coordinator or other available authorized EPA officer and in accordance with all applicable provisions of the Health and Safety Plans, the Contingency Plans, and any other applicable plans or documents developed pursuant to the SOW. In the event that Settling Defendants fail to take appropriate response action as required by this Section, and EPA takes such action instead, Settling Defendants shall reimburse EPA all costs of the response action under Section XV (Payments for Response Costs).

46. Subject to Section XX (Covenants by Plaintiffs), nothing in the preceding Paragraph or in this Consent Decree shall be deemed to limit any authority of the United States (a) to take all appropriate action to protect human health and the environment or to prevent, abate, respond to, or minimize an actual or threatened release of Waste Material on, at, or from the NHOU, or (b) to direct or order such action, or seek an order from the Court, to protect human health and the environment or to prevent, abate, respond to, or minimize an actual or threatened release of Waste Material on, at, or from the NHOU.

XV. PAYMENTS FOR RESPONSE COSTS

47. Payment by Settling Defendants for Past Response Costs.

a. Within 30 days of the Effective Date, Settling Defendants shall pay to EPA \$9,527,405 in payment for Past Response Costs. Payment shall be made in accordance with Paragraphs 49.a and 49.c (Payment Instructions).

b. The total amount to be paid by Settling Defendants pursuant to Paragraph 47.a shall be deposited by EPA in the NHOU Special Account to be retained and used to conduct or finance response actions at or in connection with the Site, or to be transferred by EPA to the EPA Hazardous Substance Superfund.

48. Payments by Settling Defendants for Future Response Costs. Settling Defendants shall pay to EPA all Future Response Costs not inconsistent with the NCP.

a. On a periodic basis, EPA will send Settling Defendants a bill requiring payment that includes an EPA cost summary, which includes direct and indirect costs incurred by EPA and its contractors, and a DOJ case cost summary. Settling Defendants shall make all payments within 30 days of Settling Defendants' receipt of each bill requiring payment, except

as otherwise provided in Paragraph 50, in accordance with Paragraphs 49.b and 49.c (Payment Instructions).

b. All Future Response Costs to be paid by Settling Defendants shall be deposited by EPA in the NHOU Special Account to be retained and used to conduct or finance response actions at or in connection with the Site, or to be transferred by EPA to the EPA Hazardous Substance Superfund. Payment of all stipulated penalties shall be made to the Hazardous Substance Superfund.

49. Payment Instructions for Settling Defendants.

a. Instructions for Past Response Costs Payments. All payments required, elsewhere in this Consent Decree, to be made in accordance with this Paragraph 49.a shall be made at <https://www.pay.gov> to the U.S. Department of Justice account, in accordance with instructions provided to Settling Defendants by the Financial Litigation Unit (“FLU”) of the United States Attorney’s Office for the Eastern District of California after the Effective Date. Any payments exceeding \$9.9 million and required, elsewhere in this Consent Decree, to be made in accordance with this Paragraph may be made by FedWire Electronic Funds Transfer (“EFT”) to the U.S. Department of Justice account in accordance with current EFT procedures, and in accordance with instructions provided to Settling Defendants by the FLU after the Effective Date. The payment instructions provided by the FLU shall include a Consolidated Debt Collection System (“CDCS”) number, which shall be used to identify all payments required to be made in accordance with this Consent Decree. The FLU shall provide the payment instructions to:

[Insert name, address, phone number and email address of the individual who will be responsible for making the payment]

on behalf of Settling Defendants. Settling Defendants may change the individual to receive payment instructions on their behalf by providing written notice of such change in accordance with Section XXV (Notices and Submissions).

b. Instructions for Future Response Costs Payments and Stipulated Penalties. All payments required, elsewhere in this Consent Decree, to be made in accordance with this Paragraph 49.b shall be made by Fedwire EFT to:

Federal Reserve Bank of New York
ABA = 021030004
Account = 68010727
SWIFT address = FRNYUS33
33 Liberty Street
New York NY 10045
Field Tag 4200 of the Fedwire message should read “D 68010727 Environmental Protection Agency”

c. Instructions for All Payments. All payments made under Paragraph 49.a or 49.b shall reference the CDCS Number, EPA Site/Spill ID Number 09N1 and DOJ Case Number _____. At the time of any payment required to be made in accordance with Paragraphs 49.a or 49.b, Settling Defendants shall send notice that payment has been made to the United

States, and to EPA, in accordance with Section XXV (Notices and Submissions), and to the EPA Cincinnati Finance Office by email at acctsreceivable.cinwd@epa.gov, or by mail at 26 Martin Luther King Drive, Cincinnati, Ohio 45268. Such notice shall also reference the CDCS Number, Site/Spill ID Number, and DOJ Case Number.

50. Settling Defendants may contest any Future Response Costs billed under Paragraph 48 if they determine that EPA has made a mathematical error or included a cost item that is not within the definition of Future Response Costs, or if they believe EPA incurred excess costs as a direct result of an EPA action that was inconsistent with a specific provision or provisions of the NCP. Such objection shall be made in writing within 30 days of receipt of the bill and must be sent to the United States pursuant to Section XXV (Notices and Submissions). Any such objection shall specifically identify the contested Future Response Costs and the basis for objection. In the event of an objection, Settling Defendants shall pay all uncontested Future Response Costs to the United States within 30 days of Settling Defendants' receipt of the bill requiring payment. Simultaneously, Settling Defendants shall establish an interest-bearing escrow account in a federally-insured bank duly chartered in the State of California and remit to that escrow account funds equivalent to the amount of the contested Future Response Costs. Settling Defendants shall send to the United States, as provided in Section XXV (Notices and Submissions), a copy of the transmittal letter and check paying the uncontested Future Response Costs, and a copy of the correspondence that establishes and funds the escrow account, including, but not limited to, information containing the identity of the bank and bank account under which the escrow account is established as well as a bank statement showing the initial balance of the escrow account. Simultaneously with establishment of the escrow account, Settling Defendants shall initiate the Dispute Resolution procedures in Section XVIII (Dispute Resolution). If the United States prevails in the dispute, Settling Defendants shall pay the sums due (with accrued interest) to the United States within five days of the resolution of the dispute. If Settling Defendants prevail concerning any aspect of the contested costs, Settling Defendants shall pay that portion of the costs (plus associated accrued interest) for which they did not prevail to the United States within five days of the resolution of the dispute. Settling Defendants shall be disbursed any balance of the escrow account. All payments to the United States under this Paragraph shall be made in accordance with Paragraphs 49.b and 49.c (Payment Instructions). The dispute resolution procedures set forth in this Paragraph in conjunction with the procedures set forth in Section XVIII (Dispute Resolution) shall be the exclusive mechanisms for resolving disputes regarding Settling Defendants' obligation to reimburse the United States for its Future Response Costs.

51. Interest. In the event that any payment for Past Response Costs or for Future Response Costs required under this Section is not made by the date required, Settling Defendants shall pay Interest on the unpaid balance. The Interest to be paid on Past Response Costs under this Paragraph shall begin to accrue on the Effective Date. The Interest on Future Response Costs shall begin to accrue on the date of the bill. The Interest shall accrue through the date of Settling Defendants' payment. Payments of Interest made under this Paragraph shall be in addition to such other remedies or sanctions available to Plaintiffs by virtue of Settling Defendants' failure to make timely payments under this Section including, but not limited to, payment of stipulated penalties pursuant to Paragraph 66.

XVI. INDEMNIFICATION AND INSURANCE

52. Settling Defendants' Indemnification of the United States.

a. The United States does not assume any liability by entering into this Consent Decree or by virtue of any designation of Settling Defendants as EPA's authorized representatives under Section 104(e) of CERCLA, 42 U.S.C. § 9604(e). Settling Defendants shall indemnify, save and hold harmless the United States and its officials, agents, employees, contractors, subcontractors, or representatives for or from any and all claims or causes of action arising from, or on account of, negligent or other wrongful acts or omissions of Settling Defendants, their officers, directors, employees, agents, contractors, subcontractors, and any persons acting on their behalf or under their control, in carrying out activities pursuant to this Consent Decree, including, but not limited to, any claims arising from any designation of Settling Defendants as EPA's authorized representatives under Section 104(e) of CERCLA. Further, Settling Defendants agree to pay the United States all costs it incurs including, but not limited to, attorneys' fees and other expenses of litigation and settlement arising from, or on account of, claims made against the United States based on negligent or other wrongful acts or omissions of Settling Defendants, their officers, directors, employees, agents, contractors, subcontractors, and any persons acting on their behalf or under their control, in carrying out activities pursuant to this Consent Decree. The United States shall not be held out as a party to any contract entered into by or on behalf of Settling Defendants in carrying out activities pursuant to this Consent Decree. Neither Settling Defendants nor any such contractor shall be considered an agent of the United States.

b. The United States shall give Settling Defendants notice of any claim for which the United States plans to seek indemnification pursuant to Paragraph 52, and shall consult with Settling Defendants prior to settling such claim.

53. Settling Defendants covenant not to sue and agree not to assert any claims or causes of action against the United States for damages or reimbursement or for set-off of any payments made or to be made to the United States, arising from or on account of any contract, agreement, or arrangement between any one or more of Settling Defendants and any person for performance of Work on or relating to the Site, including, but not limited to, claims on account of construction delays. In addition, Settling Defendants shall indemnify and hold harmless the United States with respect to any and all claims for damages or reimbursement arising from or on account of any contract, agreement, or arrangement between any one or more of Settling Defendants and any person for performance of Work on or relating to the Site, including, but not limited to, claims on account of construction delays.

54. No later than 15 days before commencing any on-site Work, Settling Defendants shall secure, and shall maintain until the first anniversary of EPA's Certification of Completion of the Work pursuant to Paragraph 44 of Section XIII (Certification of Completion) commercial general liability insurance with limits of \$2,000,000, for any one occurrence, and automobile liability insurance with limits of \$2,000,000, combined single limit, naming the United States as an additional insured with respect to all liability arising out of the activities performed by or on behalf of Settling Defendants pursuant to this Consent Decree. In addition, for the duration of this Consent Decree, Settling Defendants shall satisfy, or shall ensure that their contractors or subcontractors satisfy, all applicable laws and regulations regarding the provision of worker's

compensation insurance for all persons performing the Work on behalf of Settling Defendants in furtherance of this Consent Decree. Prior to commencement of the Work under this Consent Decree, Settling Defendants shall provide to EPA certificates of such insurance and a copy of each insurance policy. Settling Defendants shall resubmit such certificates and copies of policies each year on the anniversary of the Effective Date. If Settling Defendants demonstrate by evidence satisfactory to EPA that any contractor or subcontractor maintains insurance equivalent to that described above, or insurance covering the same risks but in a lesser amount, then, with respect to that contractor or subcontractor, Settling Defendants need provide only that portion of the insurance described above that is not maintained by the contractor or subcontractor.

XVII. FORCE MAJEURE

55. “Force majeure,” for purposes of this Consent Decree, is defined as any event arising from causes beyond the control of Settling Defendants, of any entity controlled by Settling Defendants, or of Settling Defendants’ contractors, that delays or prevents the performance of any obligation under this Consent Decree despite Settling Defendants’ best efforts to fulfill the obligation. The requirement that Settling Defendants exercise “best efforts to fulfill the obligation” includes using best efforts to anticipate any potential force majeure and best efforts to address the effects of any potential force majeure (1) as it is occurring and (2) following the potential force majeure such that the delay and any adverse effects of the delay are minimized to the greatest extent possible. “Force majeure” does not include financial inability to complete the Work or a failure to achieve the Performance Standards.

56. If any event occurs or has occurred that may delay the performance of any obligation under this Consent Decree for which Settling Defendants intend or may intend to assert a claim of force majeure, Settling Defendants shall notify orally EPA’s Project Coordinator or, in his or her absence, EPA’s Alternate Project Coordinator or, in the event both of EPA’s designated representatives are unavailable, the Director of the Superfund Division, EPA Region IX, within 24 hours of when Settling Defendants first knew that the event might cause a delay. Within five days thereafter, Settling Defendants shall provide in writing to EPA an explanation and description of the reasons for the delay; the anticipated duration of the delay; all actions taken or to be taken to prevent or minimize the delay; a schedule for implementation of any measures to be taken to prevent or mitigate the delay or the effect of the delay; Settling Defendants’ rationale for attributing such delay to a force majeure; and a statement as to whether, in the opinion of Settling Defendants, such event may cause or contribute to an endangerment to public health or welfare, or the environment. Settling Defendants shall include with any notice all available documentation supporting their claim that the delay was attributable to a force majeure. Settling Defendants shall be deemed to know of any circumstance of which Settling Defendants, any entity controlled by Settling Defendants, or Settling Defendants’ contractors knew or should have known. Failure to comply with the above requirements regarding an event shall preclude Settling Defendants from asserting any claim of force majeure regarding that event, provided, however, that if EPA, despite the late notice, is able to assess to its satisfaction whether the event is a force majeure under Paragraph 55 and whether Settling Defendants have exercised their best efforts under Paragraph 55, EPA may, in its unreviewable discretion, excuse in writing Settling Defendants’ failure to submit timely notices under this Paragraph.

57. If EPA agrees that the delay or anticipated delay is attributable to a force majeure, the time for performance of the obligations under this Consent Decree that are affected by the force majeure will be extended by EPA for such time as is necessary to complete those obligations. An extension of the time for performance of the obligations affected by the force majeure shall not, of itself, extend the time for performance of any other obligation. If EPA does not agree that the delay or anticipated delay has been or will be caused by a force majeure, EPA will notify Settling Defendants in writing of its decision. If EPA agrees that the delay is attributable to a force majeure, EPA will notify Settling Defendants in writing of the length of the extension, if any, for performance of the obligations affected by the force majeure.

58. If Settling Defendants elect to invoke the dispute resolution procedures set forth in Section XVIII (Dispute Resolution), they shall do so no later than 15 days after receipt of EPA's notice. In any such proceeding, Settling Defendants shall have the burden of demonstrating by a preponderance of the evidence that the delay or anticipated delay has been or will be caused by a force majeure, that the duration of the delay or the extension sought was or will be warranted under the circumstances, that best efforts were exercised to avoid and mitigate the effects of the delay, and that Settling Defendants complied with the requirements of Paragraphs 55 and 56. If Settling Defendants carry this burden, the delay at issue shall be deemed not to be a violation by Settling Defendants of the affected obligation of this Consent Decree identified to EPA and the Court.

XVIII. DISPUTE RESOLUTION

59. Unless otherwise expressly provided for in this Consent Decree, the dispute resolution procedures of this Section shall be the exclusive mechanism to resolve disputes regarding this Consent Decree. However, the procedures set forth in this Section shall not apply to actions by the United States to enforce obligations of Settling Defendants that have not been disputed in accordance with this Section.

60. Any dispute regarding this Consent Decree shall in the first instance be the subject of informal negotiations between the parties to the dispute. The period for informal negotiations shall not exceed 20 days from the time the dispute arises, unless it is modified by written agreement of the parties to the dispute. The dispute shall be considered to have arisen when one party sends the other parties a written Notice of Dispute.

61. Statements of Position.

a. In the event that the parties cannot resolve a dispute by informal negotiations under the preceding Paragraph, then the position advanced by EPA shall be considered binding unless, within 30 days after the conclusion of the informal negotiation period, Settling Defendants invoke the formal dispute resolution procedures of this Section by serving on the United States a written Statement of Position on the matter in dispute, including, but not limited to, any factual data, analysis or opinion supporting that position and any supporting documentation relied upon by Settling Defendants. The Statement of Position shall specify Settling Defendants' position as to whether formal dispute resolution should proceed under Paragraph 62 or Paragraph 63.

b. Within 30 days after receipt of Settling Defendants' Statement of Position, EPA will serve on Settling Defendants its Statement of Position, including, but not limited to, any factual data, analysis, or opinion supporting that position and all supporting documentation

relied upon by EPA. EPA's Statement of Position shall include a statement as to whether formal dispute resolution should proceed under Paragraph 62 or 63. Within seven days after receipt of EPA's Statement of Position, Settling Defendants may submit a Reply.

c. If there is disagreement between EPA and Settling Defendants as to whether dispute resolution should proceed under Paragraph 62 or 63, the parties to the dispute shall follow the procedures set forth in the paragraph determined by EPA to be applicable. However, if Settling Defendants ultimately appeal to the Court to resolve the dispute, the Court shall determine which paragraph is applicable in accordance with the standards of applicability set forth in Paragraphs 62 and 63.

62. Record Review. Formal dispute resolution for disputes pertaining to the selection or adequacy of any response action and all other disputes that are accorded review on the administrative record under applicable principles of administrative law shall be conducted pursuant to the procedures set forth in this Paragraph. For purposes of this Paragraph, the adequacy of any response action includes, without limitation, the adequacy or appropriateness of plans, procedures to implement plans, or any other items requiring approval by EPA under this Consent Decree, and the adequacy of the performance of response actions taken pursuant to this Consent Decree. Nothing in this Consent Decree shall be construed to allow any dispute by Settling Defendants regarding the validity of the ROD's provisions.

a. An administrative record of the dispute shall be maintained by EPA and shall contain all statements of position, including supporting documentation, submitted pursuant to this Section. Where appropriate, EPA may allow submission of supplemental statements of position by the parties to the dispute.

b. The Director of the Superfund Division, EPA Region IX, will issue a final administrative decision resolving the dispute based on the administrative record described in Paragraph 62.a. This decision shall be binding upon Settling Defendants, subject only to the right to seek judicial review pursuant to Paragraphs 62.c and 62.d.

c. Any administrative decision made by EPA pursuant to Paragraph 62.b. shall be reviewable by this Court, provided that a motion for judicial review of the decision is filed by Settling Defendants with the Court and served on all Parties within ten days of receipt of EPA's decision. The motion shall include a description of the matter in dispute, the efforts made by the parties to resolve it, the relief requested, and the schedule, if any, within which the dispute must be resolved to ensure orderly implementation of this Consent Decree. The United States may file a response to Settling Defendants' motion.

d. In proceedings on any dispute governed by this Paragraph, Settling Defendants shall have the burden of demonstrating that the decision of the Superfund Division Director is arbitrary and capricious or otherwise not in accordance with law. Judicial review of EPA's decision shall be on the administrative record compiled pursuant to Paragraph 62.a.

63. Formal dispute resolution for disputes that neither pertain to the selection or adequacy of any response action nor are otherwise accorded review on the administrative record under applicable principles of administrative law, shall be governed by this Paragraph.

a. Following receipt of Settling Defendants' Statement of Position submitted pursuant to Paragraph 61, the Director of the Superfund Division, EPA Region IX, will issue a

final decision resolving the dispute. The Superfund Division Director's decision shall be binding on Settling Defendants unless, within ten days of receipt of the decision, Settling Defendants file with the Court and serve on the parties a motion for judicial review of the decision setting forth the matter in dispute, the efforts made by the parties to resolve it, the relief requested, and the schedule, if any, within which the dispute must be resolved to ensure orderly implementation of the Consent Decree. The United States may file a response to Settling Defendants' motion.

b. Notwithstanding Paragraph M (CERCLA Section 113(j) Record Review of ROD and Work) of Section I (Background), judicial review of any dispute governed by this Paragraph shall be governed by applicable principles of law.

64. The invocation of formal dispute resolution procedures under this Section shall not extend, postpone, or affect in any way any obligation of Settling Defendants under this Consent Decree, not directly in dispute, unless EPA or the Court agrees otherwise. Stipulated penalties with respect to the disputed matter shall continue to accrue but payment shall be stayed pending resolution of the dispute as provided in Paragraph 72. Notwithstanding the stay of payment, stipulated penalties shall accrue from the first day of noncompliance with any applicable provision of this Consent Decree. In the event that Settling Defendants do not prevail on the disputed issue, stipulated penalties shall be assessed and paid as provided in Section XIX (Stipulated Penalties).

XIX. STIPULATED PENALTIES

65. Settling Defendants shall be liable for stipulated penalties in the amounts set forth in Paragraphs 66 and 67 to the United States for failure to comply with the requirements of this Consent Decree specified below, unless excused under Section XVII (Force Majeure). "Compliance" by Settling Defendants shall include completion of all payments and activities required under this Consent Decree, or any plan, report, or other deliverable approved under this Consent Decree, in accordance with all applicable requirements of law, this Consent Decree, the SOW, and any plans, reports, or other deliverables approved under this Consent Decree and within the specified time schedules established by and approved under this Consent Decree.

66. Stipulated Penalty Amounts - Work (Including Payments and Excluding Plans, Reports, and Other Deliverables).

a. The following stipulated penalties shall accrue per violation per day for any noncompliance identified in Paragraph 66.b:

<u>Penalty Per Violation Per Day</u>	<u>Period of Noncompliance</u>
\$3,000	1st through 14th day
\$7,000	15th through 30th day
\$10,000	31st day and beyond

b. Compliance Milestones.

1. Initiation of construction of the Remedial Action.
2. Completion of construction of the Remedial Action.
3. Pre-Certification inspection.

4. Initial achievement of Performance Standards for COCs in Extracted and Treated Groundwater as set forth in Table 6 of the ROD, the SOW, and the Pre-Achievement O&M plan.
5. Continued achievement of Performance Standards for COCs in Extracted and Treated Groundwater as set forth in Table 6 of the ROD and the Post-Achievement O&M plan.
6. Timely payment of Future Response Costs.
7. Timely payment of Past Response Costs.
8. Completion of all outstanding tasks identified in the Final Certification Inspection as described in the SOW.
9. Providing or arranging for access as set forth in Paragraphs 20 and 21.

67. Stipulated Penalty Amounts - Plans, Reports, and other Deliverables. The following stipulated penalties shall accrue per violation per day for failure to submit timely or adequate reports or other plans or deliverables as otherwise required in this Consent Decree and the SOW:

<u>Penalty Per Violation Per Day</u>	<u>Period of Noncompliance</u>
\$1,500	1st through 14th day
\$3,000	15th through 30th day
\$5,000	31st day and beyond

68. In the event that EPA assumes performance of a portion or all of the Work pursuant to Paragraph 82 (Work Takeover), Settling Defendants shall be liable for a stipulated penalty in the amount of \$10,000,000. Stipulated penalties under this Paragraph are in addition to the remedies available under Paragraphs 42 (Funding for Work Takeover) and 82 (Work Takeover).

69. All penalties shall begin to accrue on the day after the complete performance is due or the day a violation occurs, and shall continue to accrue through the final day of the correction of the noncompliance or completion of the activity. However, stipulated penalties shall not accrue: (a) with respect to a deficient submission under Section X (EPA Approval of Plans and Other Submissions), during the period, if any, beginning on the 31st day after EPA's receipt of such submission until the date that EPA notifies Settling Defendants of any deficiency; (b) with respect to a decision by the Director of the Superfund Division, EPA Region IX, under Paragraph 62.b or 63.a of Section XVIII (Dispute Resolution), during the period, if any, beginning on the 21st day after the date that Settling Defendants' reply to EPA's Statement of Position is received until the date that the Director issues a final decision regarding such dispute; or (c) with respect to judicial review by this Court of any dispute under Section XVIII (Dispute Resolution), during the period, if any, beginning on the 31st day after the Court's receipt of the final submission regarding the dispute until the date that the Court issues a final decision regarding such dispute. Nothing in this Consent Decree shall prevent the simultaneous accrual of separate penalties for separate violations of this Consent Decree.

70. Following EPA's determination that Settling Defendants have failed to comply with a requirement of this Consent Decree, EPA may give Settling Defendants written notification of the same and describe the noncompliance. EPA may send Settling Defendants a written demand for the payment of the penalties. However, penalties shall accrue as provided in the preceding Paragraph regardless of whether EPA has notified Settling Defendants of a violation.

71. All penalties accruing under this Section shall be due and payable to the United States within 30 days of Settling Defendants' receipt from EPA of a demand for payment of the penalties, unless Settling Defendants invoke the Dispute Resolution procedures under Section XVIII (Dispute Resolution) within the 30-day period. All payments to the United States under this Section shall indicate that the payment is for stipulated penalties, and shall be made in accordance with Paragraphs 49.b and 49.c (Payment Instructions).

72. Penalties shall continue to accrue as provided in Paragraph 69 during any dispute resolution period, but need not be paid until the following:

c. If the dispute is resolved by agreement of the Parties or by a decision of EPA that is not appealed to this Court, accrued penalties determined to be owed shall be paid to EPA within 15 days of the agreement or the receipt of EPA's decision or order;

d. If the dispute is appealed to this Court and the United States prevails in whole or in part, Settling Defendants shall pay all accrued penalties determined by the Court to be owed to EPA within 60 days of receipt of the Court's decision or order, except as provided in Paragraph 72.c;

e. If the District Court's decision is appealed by any Party, Settling Defendants shall pay all accrued penalties determined by the District Court to be owed to the United States into an interest-bearing escrow account within 60 days of receipt of the Court's decision or order. Penalties shall be paid into this account as they continue to accrue, at least every 60 days. Within 15 days of receipt of the final appellate court decision, the escrow agent shall pay the balance of the account to EPA or to Settling Defendants to the extent that they prevail.

73. If Settling Defendants fail to pay stipulated penalties when due, Settling Defendants shall pay Interest on the unpaid stipulated penalties as follows: (a) if Settling Defendants have timely invoked dispute resolution such that the obligation to pay stipulated penalties has been stayed pending the outcome of dispute resolution, Interest shall accrue from the date stipulated penalties are due pursuant to Paragraph 72 until the date of payment; and (b) if Settling Defendants fail to timely invoke dispute resolution, Interest shall accrue from the date of demand under Paragraph 71 until the date of payment. If Settling Defendants fail to pay stipulated penalties and Interest when due, the United States may institute proceedings to collect the penalties and Interest.

74. The payment of penalties and Interest, if any, shall not alter in any way Settling Defendants' obligation to complete the performance of the Work required under this Consent Decree.

75. Nothing in this Consent Decree shall be construed as prohibiting, altering, or in any way limiting the ability of the United States to seek any other remedies or sanctions

available by virtue of Settling Defendants' violation of this Consent Decree or of the statutes and regulations upon which it is based, including, but not limited to, penalties pursuant to Section 122(l) of CERCLA, 42 U.S.C. § 9622(l), provided, however, that the United States shall not seek civil penalties pursuant to Section 122(l) of CERCLA for any violation for which a stipulated penalty is provided in this Consent Decree, except in the case of a willful violation of this Consent Decree.

76. Notwithstanding any other provision of this Section, the United States may, in its unreviewable discretion, waive any portion of stipulated penalties that have accrued pursuant to this Consent Decree.

XX. COVENANTS BY PLAINTIFF

77. Covenants for Settling Defendants by United States. In consideration of the actions that will be performed and the payments that will be made by Settling Defendants under this Consent Decree, and except as specifically provided in Paragraph 78, 79, and 81 of this Section, the United States covenants not to sue or to take administrative action against Settling Defendants pursuant to Sections 106 and 107(a) of CERCLA for the Work, Past Response Costs, and Future Response Costs. These covenants shall take effect upon the receipt by EPA of the payments required by Paragraph 47.a (Payments for Past Response Costs) and any Interest or stipulated penalties due thereon under Paragraph 51 (Interest) or Section XIX (Stipulated Penalties). These covenants are conditioned upon the satisfactory performance by Settling Defendants of their obligations under this Consent Decree. These covenants extend only to Settling Defendants and do not extend to any other person.

78. United States' Pre-certification Reservations. Notwithstanding any other provision of this Consent Decree, the United States reserves, and this Consent Decree is without prejudice to, the right to institute proceedings in this action or in a new action, or to issue an administrative order, seeking to compel Settling Defendants to perform further response actions relating to the NHOU and/or to pay the United States for additional costs of response if, (a) prior to Certification of Completion of the Remedial Action, (i) conditions at the NHOU, previously unknown to EPA, are discovered, or (ii) information, previously unknown to EPA, is received, in whole or in part, and (b) EPA determines that these previously unknown conditions or information together with any other relevant information indicates that the Remedial Action is not protective of human health or the environment.

79. United States' Post-certification Reservations. Notwithstanding any other provision of this Consent Decree, the United States reserves, and this Consent Decree is without prejudice to, the right to institute proceedings in this action or in a new action or to issue an administrative order, seeking to compel Settling Defendants to perform further response actions relating to the NHOU and/or to pay the United States for additional costs of response if, (a) subsequent to Certification of Completion of the Remedial Action, (i) conditions at the NHOU, previously unknown to EPA, are discovered, or (ii) information, previously unknown to EPA, is received, in whole or in part, and (b) EPA determines that these previously unknown conditions or this information together with other relevant information indicate that the Remedial Action is not protective of human health or the environment.

80. For purposes of Paragraph 78, the information and the conditions known to EPA will include only that information and those conditions known to EPA as of the date the ROD

was signed and set forth in the ROD for the NHOU and the administrative record supporting the ROD. For purposes of Paragraph 79, the information and the conditions known to EPA shall include only that information and those conditions known to EPA as of the date of Certification of Completion of the Remedial Action and set forth in the ROD, the administrative record supporting the ROD, the post-ROD administrative record, or in any information received by EPA pursuant to the requirements of this Consent Decree prior to Certification of Completion of the Remedial Action.

81. General Reservations of Rights. The United States reserves, and this Consent Decree is without prejudice to, all rights against Settling Defendants with respect to all matters not expressly included within Plaintiff's covenants. Notwithstanding any other provision of this Consent Decree, the United States reserves all rights against Settling Defendants with respect to:

- a. claims based on a failure by Settling Defendants to meet a requirement of this Consent Decree, the SOW, or any work plan or other submittal approved by EPA;
- b. liability arising from the past, present, or future disposal, release, or threat of release of Waste Material outside of the NHOU;
- c. liability based on the ownership or operation of real property by Settling Defendants when such ownership or operation commences after signature of this Consent Decree;
- d. liability based on Settling Defendants' transportation, treatment, storage, or disposal, or the arrangement for the transportation, treatment, storage, or disposal of Waste Material at or in connection with the NHOU, other than as provided in the ROD, the Work, or otherwise ordered by EPA, after signature of this Consent Decree;
- e. liability for damages for injury to, destruction of, or loss of natural resources, and for the costs of any natural resource damage assessments;
- f. criminal liability;
- g. liability for violations of federal or state law which occur during or after implementation of the Work;
- h. liability, prior to achievement of Performance Standards in accordance with Paragraph 12, for additional response actions that EPA determines are necessary to achieve and maintain Performance Standards or to carry out and maintain the effectiveness of the remedy set forth in the ROD, but that cannot be required pursuant to Paragraph 13 (Modification of SOW or Related Work Plans);
- i. liability for response costs and response actions associated with any amendment to the ROD or any explanation of significant differences.
- j. liability for response costs and response actions associated with additional interim remedial actions at the NHOU or a final remedial action at the NHOU.
- k. liability for response costs (other than Basin-wide Costs paid pursuant to this Consent Decree) and response actions associated with operable units other than the NHOU that are within the San Fernando Valley Area 1, Area 2, Area 3, or Area 4 Superfund Sites or for a final remedial action at the Site or for any or all of the San Fernando Valley Superfund Sites;

- l. Liability for response actions that are not within the definition of Work.
- m. liability for costs that the United States will incur regarding the NHOU but which are not within the definition of Future Response Costs;
- n. previously incurred costs of response above the amounts paid pursuant to Paragraph 47 (Payment of Past Response Costs); and
- o. liability for costs incurred or to be incurred by the Agency for Toxic Substances and Disease Registry regarding the NHOU.

82. Work Takeover.

a. In the event EPA determines that Settling Defendants have (1) ceased implementation of any portion of the Work, or (2) are seriously or repeatedly deficient or late in their performance of the Work, or (3) are implementing the Work in a manner that may cause an endangerment to human health or the environment, EPA may issue a written notice (“Work Takeover Notice”) to Settling Defendants. Any Work Takeover Notice issued by EPA will specify the grounds upon which such notice was issued and will provide Settling Defendants a period of ten days within which to remedy the circumstances giving rise to EPA’s issuance of such notice.

b. If, after expiration of the ten-day notice period specified in Paragraph 82.a, Settling Defendants have not remedied to EPA’s satisfaction the circumstances giving rise to EPA’s issuance of the relevant Work Takeover Notice, EPA may at any time thereafter assume the performance of all or any portion(s) of the Work as EPA deems necessary (“Work Takeover”). EPA will notify Settling Defendants in writing (which writing may be electronic) if EPA determines that implementation of a Work Takeover is warranted under this Paragraph 82.b. Funding of Work Takeover costs is addressed under Paragraph 42.

c. Settling Defendants may invoke the procedures set forth in Paragraph 62 (Record Review), to dispute EPA’s implementation of a Work Takeover under Paragraph 82.b. However, notwithstanding Settling Defendants’ invocation of such dispute resolution procedures, and during the pendency of any such dispute, EPA may in its sole discretion commence and continue a Work Takeover under Paragraph 82.b until the earlier of (1) the date that Settling Defendants remedy, to EPA’s satisfaction, the circumstances giving rise to EPA’s issuance of the relevant Work Takeover Notice, or (2) the date that a final decision is rendered in accordance with Paragraph 62 (Record Review) requiring EPA to terminate such Work Takeover.

83. Notwithstanding any other provision of this Consent Decree, the United States retains all authority and reserves all rights to take any and all response actions authorized by law.

XXI. COVENANTS BY SETTLING DEFENDANTS

84. Covenant Not to Sue by Settling Defendants. Subject to the reservations in Paragraph 86, Settling Defendants covenant not to sue and agree not to assert any claims or causes of action against the United States with respect to the Work, past response actions regarding the NHOU, Past Response Costs, Future Response Costs, and this Consent Decree, including, but not limited to:

a. any direct or indirect claim for reimbursement from the Hazardous Substance Superfund (established pursuant to the Internal Revenue Code, 26 U.S.C. § 9507) through CERCLA Sections 106(b)(2), 107, 111, 112, 113 or any other provision of law;

b. any claims against the United States, including any department, agency or instrumentality of the United States under CERCLA Sections 107 or 113, RCRA Section 7002(a), 42 U.S.C. § 6972(a), or state law regarding the Work, past response actions regarding the NHOU, Past Response Costs, Future Response Costs, and this Consent Decree; or

c. any claims arising out of response actions at or in connection with the NHOU, including any claim under the United States Constitution, the California Constitution, the Tucker Act, 28 U.S.C. § 1491, the Equal Access to Justice Act, 28 U.S.C. § 2412, as amended, or at common law.

85. Except as provided in Paragraph 88 (Claims Against *De Minimis* and Ability to Pay Parties) and Paragraph 93 (Res Judicata and Other Defenses), the covenants in this Section shall not apply if the United States brings a cause of action or issues an order pursuant to any of the reservations in Section XX (Covenants by Plaintiffs), other than in Paragraphs 81.a (claims for failure to meet a requirement of the Decree), 81.f (criminal liability), and 81.g (violations of federal/state law during or after implementation of the Work), but only to the extent that Settling Defendants' claims arise from the same response action, response costs, or damages that the United States is seeking pursuant to the applicable reservation.

86. Settling Defendants reserve, and this Consent Decree is without prejudice to, claims against the United States, subject to the provisions of Chapter 171 of Title 28 of the United States Code, and brought pursuant to any statute other than CERCLA or RCRA and for which the waiver of sovereign immunity is found in a statute other than CERCLA or RCRA, for money damages for injury or loss of property or personal injury or death caused by the negligent or wrongful act or omission of any employee of the United States, as that term is defined in 28 U.S.C. § 2671, while acting within the scope of his or her office or employment under circumstances where the United States, if a private person, would be liable to the claimant in accordance with the law of the place where the act or omission occurred. However, the foregoing shall not include any claim based on EPA's selection of response actions, or the oversight or approval of Settling Defendants' plans, reports, other deliverables or activities.

87. Nothing in this Consent Decree shall be deemed to constitute preauthorization of a claim within the meaning of Section 111 of CERCLA, 42 U.S.C. § 9611, or 40 CFR § 300.700(d).

88. Claims Against *De Minimis* and Ability to Pay Parties. Settling Defendants agree not to assert any claims or causes of action and to waive all claims or causes of action (including but not limited to claims or causes of action under Sections 107(a) and 113 of CERCLA) that they may have for all matters relating to the NHOU against any person that has entered or in the future enters into a final CERCLA Section 122(g) *de minimis* settlement, or a final settlement based on limited ability to pay, with EPA with respect to the NHOU. This waiver shall not apply with respect to any defense, claim, or cause of action that a Settling Defendant may have against any person if such person asserts a claim or cause of action relating to the NHOU against such Settling Defendant.

XXII. EFFECT OF SETTLEMENT; CONTRIBUTION

89. Except as provided in Paragraph 88 (Claims Against *De Minimis*/Ability to Pay Parties), nothing in this Consent Decree shall be construed to create any rights in, or grant any cause of action to, any person not a Party to this Consent Decree. Except as provided in Paragraph 88 (Claims Against *De Minimis*/Ability to Pay Parties), each of the Parties expressly reserves any and all rights (including, but not limited to, pursuant to Section 113 of CERCLA, 42 U.S.C. § 9613), defenses, claims, demands, and causes of action which each Party may have with respect to any matter, transaction, or occurrence relating in any way to the NHOU against any person not a Party hereto. Nothing in this Consent Decree diminishes the right of the United States, pursuant to Section 113(f)(2) and (3) of CERCLA, 42 U.S.C. § 9613(f)(2)-(3), to pursue any such persons to obtain additional response costs or response action and to enter into settlements that give rise to contribution protection pursuant to Section 113(f)(2).

90. The Parties agree, and by entering this Consent Decree this Court finds, that this Consent Decree constitutes a judicially-approved settlement for purposes of Section 113(f)(2) of CERCLA, 42 U.S.C. § 9613(f)(2), and that each Settling Defendant is entitled, as of the Effective Date, to protection from contribution actions or claims as provided by Section 113(f)(2) of CERCLA, or as may be otherwise provided by law, for “matters addressed” in this Consent Decree. The “matters addressed” in this Consent Decree are the Work, Past Response Costs, and Future Response Costs.

91. Each Settling Defendant shall, with respect to any suit or claim brought by it for matters related to this Consent Decree, notify the United States in writing no later than 60 days prior to the initiation of such suit or claim.

92. Each Settling Defendant shall, with respect to any suit or claim brought against it for matters related to this Consent Decree, notify in writing the United States within ten days of service of the complaint on such Settling Defendant. In addition, each Settling Defendant shall notify the United States within ten days of service or receipt of any Motion for Summary Judgment and within ten days of receipt of any order from a court setting a case for trial.

93. Res Judicata and Other Defenses. In any subsequent administrative or judicial proceeding initiated by the United States for injunctive relief, recovery of response costs, or other appropriate relief relating to the NHOU, Settling Defendants shall not assert, and may not maintain, any defense or claim based upon the principles of waiver, res judicata, collateral estoppel, issue preclusion, claim-splitting, or other defenses based upon any contention that the claims raised by the United States in the subsequent proceeding were or should have been brought in the instant case; provided, however, that nothing in this Paragraph affects the enforceability of the covenants not to sue set forth in Section XX (Covenants by Plaintiff).

XXIII. ACCESS TO INFORMATION

94. Settling Defendants shall provide to EPA, upon request, copies of all records, reports, documents, and other information (including records, reports, documents, and other information in electronic form) (hereinafter referred to as “Records”) within their possession or control or that of their contractors or agents relating to activities at the NHOU or to the implementation of this Consent Decree, including, but not limited to, sampling, analysis, chain of custody records, manifests, trucking logs, receipts, reports, sample traffic routing, correspondence, or other documents or information regarding the Work. Settling Defendants

shall also make available to EPA, for purposes of investigation, information gathering, or testimony, their employees, agents, or representatives with knowledge of relevant facts concerning the performance of the Work.

95. Business Confidential and Privileged Documents.

a. Settling Defendants may assert business confidentiality claims covering part or all of the Records submitted to Plaintiff under this Consent Decree to the extent permitted by and in accordance with Section 104(e)(7) of CERCLA, 42 U.S.C. § 9604(e)(7), and 40 CFR § 2.203(b). Records determined to be confidential by EPA will be afforded the protection specified in 40 CFR Part 2, Subpart B. If no claim of confidentiality accompanies Records when they are submitted to EPA, or if EPA has notified Settling Defendants that the Records are not confidential under the standards of Section 104(e)(7) of CERCLA or 40 CFR Part 2, Subpart B, the public may be given access to such Records without further notice to Settling Defendants.

b. Settling Defendants may assert that certain Records are privileged under the attorney-client privilege or any other privilege recognized by federal law. If Settling Defendants assert such a privilege in lieu of providing Records, they shall provide Plaintiff with the following: (1) the title of the Record; (2) the date of the Record; (3) the name, title, affiliation (e.g., company or firm), and address of the author of the Record; (4) the name and title of each addressee and recipient; (5) a description of the contents of the Record; and (6) the privilege asserted by Settling Defendants. If a claim of privilege applies only to a portion of a Record, the Record shall be provided to the United States in redacted form to mask the privileged portion only. Settling Defendants shall retain all Records that they claim to be privileged until the United States has had a reasonable opportunity to dispute the privilege claim and any such dispute has been resolved in the Settling Defendants' favor.

c. No Records created or generated pursuant to the requirements of this Consent Decree shall be withheld from the United States on the grounds that they are privileged or confidential.

96. No claim of confidentiality or privilege shall be made with respect to any data, including, but not limited to, all sampling, analytical, monitoring, hydrogeologic, scientific, chemical, or engineering data, or any other documents or information evidencing conditions at or around the NHOU.

XXIV. RETENTION OF RECORDS

97. Until ten years after Settling Defendants' receipt of EPA's notification pursuant to Paragraph 44.b of Section XIII (Certification of Completion of the Work), each Settling Defendant shall preserve and retain all non-identical copies of Records (including Records in electronic form) now in its possession or control or which come into its possession or control that relate in any manner to its liability under CERCLA with respect to the NHOU, provided, however, that Settling Defendants who are potentially liable as owners or operators of real property in the NHOU pursuant to CERCLA Section 107(a)(1) and 107(a)(2) must retain, in addition, all Records that relate to the liability of any other person under CERCLA with respect to the NHOU. Each Settling Defendant must also retain, and instruct its contractors and agents to preserve, for the same period of time specified above all non-identical copies of the last draft or final version of any Records (including Records in electronic form) now in its possession or control or which come into its possession or control that relate in any manner to the performance

of the Work, provided, however, that each Settling Defendant (and its contractors and agents) must retain, in addition, copies of all data generated during the performance of the Work and not contained in the aforementioned Records required to be retained. Each of the above record retention requirements shall apply regardless of any corporate retention policy to the contrary.

98. At the conclusion of this record retention period, Settling Defendants shall notify the United States at least 90 days prior to the destruction of any such Records, and, upon request by the United States, Settling Defendants shall deliver any such Records to EPA. Settling Defendants may assert that certain Records are privileged under the attorney-client privilege or any other privilege recognized by federal law. If Settling Defendants assert such a privilege, they shall provide Plaintiffs with the following: (a) the title of the Record; (b) the date of the Record; (c) the name, title, affiliation (e.g., company or firm), and address of the author of the Record; (d) the name and title of each addressee and recipient; (e) a description of the subject of the Record; and (f) the privilege asserted by Settling Defendants. If a claim of privilege applies only to a portion of a Record, the Record shall be provided to the United States in redacted form to mask the privileged portion only. Settling Defendants shall retain all Records that they claim to be privileged until the United States has had a reasonable opportunity to dispute the privilege claim and any such dispute has been resolved in the Settling Defendants' favor. However, no Records created or generated pursuant to the requirements of this Consent Decree shall be withheld on the grounds that they are privileged or confidential.

99. Each Settling Defendant certifies individually that, to the best of its knowledge and belief, after thorough inquiry, it has not altered, mutilated, discarded, destroyed or otherwise disposed of any Records (other than identical copies) relating to its potential liability regarding the NHOU since the earlier of notification of potential liability by the United States or the State or the filing of suit against it regarding the NHOU and that it has fully complied with any and all EPA requests for information pursuant to Sections 104(e) and 122(e) of CERCLA, 42 U.S.C. §§ 9604(e) and 9622(e), and Section 3007 of RCRA, 42 U.S.C. § 6927.

XXV. NOTICES AND SUBMISSIONS

100. Whenever, under the terms of this Consent Decree, written notice is required to be given or a report or other document is required to be sent by one Party to another, it shall be directed to the individuals at the addresses specified below, unless those individuals or their successors give notice of a change to the other Parties in writing. All notices and submissions shall be considered effective upon receipt, unless otherwise provided. Written notice as specified in this Section shall constitute complete satisfaction of any written notice requirement of the Consent Decree with respect to the United States, EPA, and Settling Defendants, respectively. Notices required to be sent to EPA, and not to the United States, under the terms of this Consent Decree should not be sent to the U.S. Department of Justice.

As to the United States:

Chief, Environmental Enforcement Section
Environment and Natural Resources Division
U.S. Department of Justice
P.O. Box 7611
Washington, D.C. 20044-7611
Re: DJ # _____

and: Kathleen Salyer
Assistant Director, Superfund Division
U.S. EPA
Region IX
75 Hawthorne Street, SFD-7
San Francisco, CA 94105

As to EPA: Kelly Manheimer
EPA Project Coordinator
U.S. EPA
Region IX
75 Hawthorne Street, SFD-7-1
San Francisco, CA 94105

As to EPA's Regional
Financial Management
Officer: David Wood
Financial Analyst
U.S. EPA
Region IX
75 Hawthorne Street, PFD-6
San Francisco, CA 94105

As to the State: [Name]
State Project Coordinator
[Address]

As to Settling Defendants: [Name]
Settling Defendants' Project Coordinator
[Address]

XXVI. RETENTION OF JURISDICTION

101. This Court retains jurisdiction over both the subject matter of this Consent Decree and Settling Defendants for the duration of the performance of the terms and provisions of this Consent Decree for the purpose of enabling any of the Parties to apply to the Court at any time for such further order, direction, and relief as may be necessary or appropriate for the construction or modification of this Consent Decree, or to effectuate or enforce compliance with its terms, or to resolve disputes in accordance with Section XVIII (Dispute Resolution).

XXVII. APPENDICES

102. The following appendices are attached to and incorporated into this Consent Decree:

“Appendix A” is the ROD.

“Appendix B” is the SOW.

“Appendix C” is the description and/or map of the NHO.

“Appendix D” is the complete list of Settling Defendants.

“Appendix E” is the performance guarantee.

XXVIII. COMMUNITY RELATIONS

103. If requested by EPA, Settling Defendants shall participate in community relations activities pursuant to the community relations plan to be developed by EPA. EPA will determine the appropriate role for Settling Defendants under the Plan. Settling Defendants shall also cooperate with EPA in providing information regarding the Work to the public. As requested by EPA, Settling Defendants shall participate in the preparation of such information for dissemination to the public and in public meetings which may be held or sponsored by EPA to explain activities at or relating to the NHOU.

Costs incurred by the United States under this Section, including the costs of any technical assistance grant under Section 117(e) of CERCLA, 42 U.S.C. § 9617(e), shall be considered Future Response Costs that Settling Defendants shall pay pursuant to Section XV (Payments for Response Costs).

XXIX. MODIFICATION

104. Except as provided in Paragraph 13 (Modification of SOW or Related Work Plans), material modifications to this Consent Decree, including the SOW, shall be in writing, signed by the United States and Settling Defendants, and shall be effective upon approval by the Court. Except as provided in Paragraph 13 (Modification of SOW or Related Work Plans), non-material modifications to this Consent Decree, including the SOW, shall be in writing and shall be effective when signed by duly authorized representatives of the United States and Settling Defendants. A modification to the SOW shall be considered material if it fundamentally alters the basic features of the selected remedy within the meaning of 40 CFR § 300.435(c)(2)(ii). Before providing its approval to any modification to the SOW, the United States will provide the State with a reasonable opportunity to review and comment on the proposed modification.

105. Modifications (non-material or material) that do not affect the obligations of or the protections afforded to any *De Minimis* Settling Defendants may be executed without the signatures of the *De Minimis* Settling Defendants.

106. Nothing in this Consent Decree shall be deemed to alter the Court’s power to enforce, supervise or approve modifications to this Consent Decree.

XXX. LODGING AND OPPORTUNITY FOR PUBLIC COMMENT

107. This Consent Decree shall be lodged with the Court for a period of not less than 30 days for public notice and comment in accordance with Section 122(d)(2) of CERCLA, 42 U.S.C. § 9622(d)(2), and 28 CFR § 50.7. The United States reserves the right to withdraw or withhold its consent if the comments regarding the Consent Decree disclose facts or considerations which indicate that the Consent Decree is inappropriate, improper, or inadequate. Settling Defendants consent to the entry of this Consent Decree without further notice.

108. If for any reason the Court should decline to approve this Consent Decree in the form presented, this agreement is voidable at the sole discretion of any Party and the terms of the agreement may not be used as evidence in any litigation between the Parties.

XXXI. SIGNATORIES/SERVICE

109. Each undersigned representative of a Settling Defendant to this Consent Decree and the Assistant Attorney General for the Environment and Natural Resources Division of the Department of Justice certifies that he or she is fully authorized to enter into the terms and conditions of this Consent Decree and to execute and legally bind such Party to this document.

110. Each Settling Defendant agrees not to oppose entry of this Consent Decree by this Court or to challenge any provision of this Consent Decree unless the United States has notified Settling Defendants in writing that it no longer supports entry of the Consent Decree.

111. Each Settling Defendant shall identify, on the attached signature page, the name, address and telephone number of an agent who is authorized to accept service of process by mail on behalf of that Party with respect to all matters arising under or relating to this Consent Decree. Settling Defendants agree to accept service in that manner and to waive the formal service requirements set forth in Rule 4 of the Federal Rules of Civil Procedure and any applicable local rules of this Court, including, but not limited to, service of a summons. Settling Defendants need not file an answer to the complaint in this action unless or until the Court expressly declines to enter this Consent Decree.

XXXII. FINAL JUDGMENT

112. This Consent Decree and its appendices constitute the final, complete, and exclusive agreement and understanding among the Parties regarding the settlement embodied in the Consent Decree. The Parties acknowledge that there are no representations, agreements or understandings relating to the settlement other than those expressly contained in this Consent Decree.

113. Upon entry of this Consent Decree by the Court, this Consent Decree shall constitute a final judgment between and among the United States and Settling Defendants. The Court finds that there is no just reason for delay and therefore] enters this judgment as a final judgment under Fed. R. Civ. P. 54 and 58.

SO ORDERED THIS __ DAY OF _____, 20__.

United States District Judge

Date

[Name]
Assistant Attorney General
Environment and Natural Resources Division
U.S. Department of Justice
Washington, D.C. 20530

Date

[Name]
Environmental Enforcement Section
Environment and Natural Resources Division
U.S. Department of Justice
P.O. Box 7611
Washington, D.C. 20044-7611

Date

Jane Diamond
Director, Superfund Division
U.S. Environmental Protection Agency
Region IX
75 Hawthorne Street
San Francisco, CA 94105

Date

Michael Massey
Assistant Regional Counsel
U.S. Environmental Protection Agency
Region IX
75 Hawthorne Street, ORC-3
San Francisco, CA 94105

FOR _____ COMPANY, INC.

Date

Agent Authorized to Accept
Service on Behalf of Above-signed
Party:

Name (print):

Title:

Address:

Name (print):

Title:

Address:

Phone:

email:

[NOTE: A separate signature page must be signed by each settlor.]

Schedule C

Statement of Work
for Remedial Design/Remedial Action

**North Hollywood Operable Unit
San Fernando Valley (Area 1) Superfund Site
Los Angeles County, California
EPA ID: CAD980894893**

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Acronyms

ARAR	Applicable or Relevant and Appropriate Requirement
CD	Consent Decree
CDPH	California Department of Public Health
CFR	Code of Federal Regulations
CQA	Construction Quality Assurance (Plan)
CSI	Construction Specification Institute
DQO	Data Quality Objective
DTSC	CA Department of Toxic Substances Control
EPA	U.S. Environmental Protection Agency
FFS	Focused Feasibility Study
FSP	Field Sampling Plan
HASP	Health and Safety Plan
ICIAP	Institutional Controls Implementation and Assurance Plan
LADWP	Los Angeles Department of Water and Power
LCA	Life Cycle Analysis
NHOU	North Hollywood Operable Unit
O&M	Operation and Maintenance
OU	Operable Unit
PCE	Tetrachloroethylene
QA/QC	Quality Assurance and Quality Control
QAPP	Quality Assurance Project Plan
QMP	Quality Management Plan
RA	Remedial Action
RAOs	Remedial Action Objectives
RD	Remedial Design
RD/RA	Remedial Design and Remedial Action
ROD	Record of Decision
RWQCB	CA Regional Water Quality Control Board
SAP	Sampling and Analysis Plan
SFV	San Fernando Valley
SMP	Site Management Plan
SOW	Statement of Work
TCE	Trichloroethylene
VE	Value Engineering
VOC	Volatile Organic Compounds

1.0 Introduction

This Statement of Work (“SOW”) sets forth the activities required to be performed by the Settling Work Defendants (“Settling Defendants”) under the consent decree between the United States and Settling Defendants, dated X/X/2011 (“CD”), to design, construct, operate, maintain, monitor, and evaluate the remedial action (“RA”) described in the Second Interim Action Record of Decision (“ROD”) for the San Fernando Valley (“SFV”) Area 1, North Hollywood Operable Unit (“NHOU”) Superfund Site signed by the EPA on September 30, 2009. The ROD presented the selected second interim remedy for the groundwater within the NHOU. This SOW is Attachment **XX** to the CD.

All terms used in this Statement of Work shall have the same meanings as defined in Section IV of the CD.

1.1 Site Description

The San Fernando Valley Area 1 Superfund Site was listed on the National Priorities List on June 10, 1984 (Comprehensive Environmental Response, Compensation, and Liability Information System (“CERCLIS”) Identification Number CAD980894893).

The NHOU is one of two operable units within the San Fernando Valley (Area 1) Superfund Site. The NHOU comprises approximately 4 square miles of contaminated groundwater underlying an area of mixed industrial, commercial, and residential land use in the community of North Hollywood (a district of the City of Los Angeles). The NHOU is approximately 15 miles north of downtown Los Angeles and immediately west of the City of Burbank, and has approximate boundaries of Sun Valley and Interstate 5 to the North, State Highway 170 and Lankershim Boulevard to the west, the Burbank Airport to the east, and Burbank Boulevard to the south (see Figure 1).

Prior to World War II, most land in the SFV was occupied by farms, orchards, and ranchland. By 1949, after the war, nearly all the land in Burbank and North Hollywood was occupied by housing developments, industrial facilities, retail establishments, and the Burbank Airport. Accompanying these land use changes in the 1940s was a substantial increase in population and groundwater withdrawals from the SFV. In the 1950s, the North Hollywood, Erwin, Whitnall, and Verdugo Well Fields were constructed by the Los Angeles Department of Water and Power (“LADWP”) in the North Hollywood area to meet the increasing demand for water. In 1968, groundwater withdrawals from the SFV were reduced to achieve “safe yield” from the basin, and more surface water was imported to the basin from external sources.

In 1979, industrial contamination was found in groundwater in the San Gabriel Valley (to the east of the SFV), prompting the California Department of Public Health (“CDPH”; formerly the California Department of Health Services) to request that all major water providers in the region, including those in the SFV, sample and analyze groundwater for potential industrial contaminants. Trichloroethylene (“TCE”) and tetrachloroethylene (“PCE”) were consistently detected in a large number of production wells in the SFV at concentrations greater than Federal and State MCLs for drinking water.

TCE and PCE were widely used in the San Fernando Valley starting in the 1940s for dry cleaning and for degreasing machinery. Disposal was not well regulated at that time, and releases from a large number of facilities throughout the eastern SFV have resulted in the large plume of groundwater contaminated with volatile organic compounds (“VOCs”) that extends from the NHOU to the southeast. To replace wells within the NHOU area contaminated by TCE and PCE, and to provide more operational flexibility for groundwater recharge and pumping in the SFV, LADWP constructed the Rinaldi-Toluca Well Field in 1988 and 1989, and the Tujunga Well Field in 1993 (see Figure 1).

1.2 Purpose

The purpose of this SOW is to set forth the requirements for the Remedial Design (“RD”) and Remedial Action (“RA”) of the remedy selected in the ROD. The RD is generally defined as those activities to be undertaken by the Settling Defendants to develop the final plans and specifications, general provisions, and specific requirements necessary to translate the ROD into the remedy to be constructed in the RA. The RD will also ensure that the remedy complies with the performance standards set forth in Sections 2.8 and 2.13.2 of the ROD (“Performance Standards”), and other requirements of the ROD and CD. The RA is generally defined as the implementation phase of remediation or construction of the remedy, including necessary operation and maintenance (“O&M”), and performance monitoring. This SOW is designed to provide the framework for conducting the RD/RA activities for the groundwater remedy within the NHOU.

The purpose of the Superfund program is to eliminate unacceptable risks to human health and the environment from abandoned hazardous waste sites. In recent years, EPA has taken a more comprehensive view of this purpose, to include life cycle analysis (“LCA”) of all the risks posed by the site, and by any resulting remediation efforts. In an effort to describe this approach in more detail, EPA has developed several guidance documents regarding “green remediation” and “greener cleanups”, such as Region IX’s policy memo, *Greener Cleanups Policy - EPA Region 9*.

1.3 General Requirements

The Settling Defendants shall furnish all necessary and appropriate personnel, materials, and services needed for, or incidental to, performing and completing the Work.

1.3.1 Performance Standards

Settling Defendants shall implement the RD/RA to achieve the Performance Standards and comply with the provisions and requirements of the ROD, the Consent Decree, and this SOW. The Remedial Action and all Work shall meet or exceed the Performance Standards set forth in the ROD, including the Remedial Action Objectives (“RAOs”) and the cleanup levels (specifically Table 6), and shall comply with all Applicable or Relevant and Appropriate Requirements (“ARARs”), and all requirements set forth in Section VI of the CD.

The RAOs for this action are:

- Prevent exposure to contaminated groundwater, above acceptable risk levels.
- Contain areas of contaminated groundwater that exceed the MCLs and notification levels to the maximum extent practicable.
- Prevent further degradation of water quality at the Rinaldi-Toluca and North Hollywood West production wells by preventing the migration toward these well fields of the more highly contaminated areas of the VOC plume located to the east/southeast.
- Achieve improved hydraulic containment to inhibit horizontal and vertical contaminant migration in groundwater from the more highly contaminated areas and depths of the aquifer to the less contaminated areas and depths of the aquifer, including the southeast portion of the NHOU in the vicinity of the Erwin and Whitnall production well fields.
- Remove contaminant mass from the aquifer.

Table 6 from the ROD is replicated in Attachment 4 to this SOW.

Additionally, if EPA determines that modifications to the work specified in this SOW or in work plans developed pursuant to this SOW are necessary to achieve and maintain the Performance Standards and/or comply with ARARs as set forth in the ROD, EPA may require that such modifications be incorporated into the appropriate work plans developed pursuant to this SOW, as set forth in Paragraph 13a of the CD.

1.3.2 Items Covered by RD/RA

Settling Defendants shall design, construct, and operate a groundwater extraction and treatment system, as well as design, install, and sample a system of monitoring wells to track the performance of the groundwater extraction and treatment system. The Work required by the CD and this SOW includes, but is not limited to, the following specific components:

Institutional Controls

EPA has determined that an institutional control is necessary, wherein EPA and the LADWP, with the participation of the Settling Defendants, work together to develop and implement a groundwater management plan that protects the effectiveness and integrity of the NHOU remedy without substantial interference with LADWP drinking water production. The groundwater management program is expected to provide for regular sharing of relevant groundwater data and pumping rate projections, planning for groundwater use, and a decision-making process to address any potential conflicts between the LADWP's pumping plans and the performance of the remedy (see Section 7 of this SOW). This shall be implemented through an Institutional Control Implementation and Assurance Plan ("ICIAP").

Groundwater and Treatment System Monitoring

Approximately 37 new monitoring wells are required to be installed as part of the remedy selected in the ROD; however, Honeywell has already installed approximately some of these wells, with plans to install 3 more. Any of the remaining wells identified in the EPA's 2009 Focused Feasibility Study ("FFS") not installed by Honeywell shall be installed pursuant to this CD and SOW.

Groundwater monitoring pursuant to this CD and SOW shall be conducted to evaluate remedy performance and track the location and movement of groundwater contamination throughout the NHOU. Monitoring shall include continued sampling and analysis of the new and existing monitoring wells within the NHOU, selected facility monitoring wells, LADWP production wells, and extraction wells in the North Hollywood area. Monitoring parameters shall include VOCs, chromium, emerging chemicals, and parameters indicative of geochemical conditions that may affect chromium speciation and transport.

Replace Existing Extraction Well NHE-1

To achieve the required hydraulic containment under the Second Interim Remedy, replacement of existing extraction well NHE-1 with a deeper well of similar construction is required.

Replace or Repair and Modify Existing Extraction Wells NHE-2, NHE-4, and NHE-5

Replacement of wells NHE-2, NHE-4, and NHE-5 with deeper wells of similar construction will likely be necessary to achieve the required hydraulic containment of the contaminated groundwater plume. Alternatively, the existing wells could remain active in their present configuration, and a new well with deeper screened intervals could be constructed adjacent to each existing well.

Wellhead Chromium Treatment at Well NHE-2

Wellhead treatment of chromium is required at existing extraction well NHE-2. Ferrous iron reduction with microfiltration is the preferred technology for a wellhead treatment system. Alternatively, an anion-exchange-based treatment process could be installed, if results expected from the pilot tests conducted at the Glendale treatment system in 2010 demonstrate that the process is effective, does not produce excessive NDMA or other problematic constituents, and is otherwise acceptable to the California Department of Public Health ("CDPH").

Although Honeywell is currently under order with the CA Regional Water Quality Control Board ("RWQCB") to install a treatment system at extraction well NHE-2 for chromium, it is not expected to be of sufficient capacity for the increased pumping rate that is expected from NHE-2. EPA therefore

anticipates that Honeywell's system will either have to be expanded, or a new system installed.

Wellhead 1,4-Dioxane Treatment at Extraction Well NHE-2

Wellhead treatment for 1,4-dioxane is required by the ROD at extraction well NHE-2. The preferred treatment technology is ultraviolet light and hydrogen-peroxide advanced oxidation process; however, during design, another treatment option may be recommended. Honeywell is currently under order with the RWQCB to install 1,4-dioxane treatment at NHE-2, but the capacity is not expected to be sufficient to treat the increased pumping rate that is expected from NHE-2.

Construct New Extraction Wells

New extraction wells are necessary to further limit contaminant migration and to improve contaminant mass removal. Based on computer modeling conducted as part of the FFS, three new wells should be located northwest of the existing NHOU treatment system in locations selected to prevent VOC and chromium migration towards the Rinaldi-Toluca well field and the western portion of the North Hollywood well field. A plan for optimizing the pumping rates of the new NHOU extraction well system shall be developed as part of the design.

Treatment of VOCs in Extracted Groundwater

Expansion of VOC treatment capacity at the NHOU will be necessary to treat the volume of groundwater produced by the existing NHOU extraction wells and the proposed additional extraction wells. The existing air stripper shall be refurbished and a second air stripper, similar in capacity to the original, shall be installed and operated in parallel with the existing system.

Ex Situ Chromium Treatment for Wells NHE-1, NEW-2, and NEW-3

Ex situ treatment of chromium shall be implemented for the combined flow from at least three extraction wells at the NHOU groundwater treatment facility. At a minimum, this system will be sized to treat the combined influent from extraction well NHE-1 and new extraction wells NEW-2 and NEW-3.

Delivery of Treated Groundwater to LADWP

The treated groundwater will be delivered to LADWP for use in its municipal supply system. Use of the NHOU treated water in LADWP's drinking water supply requires compliance with federal and state drinking water standards, including the CDPH's *Policy Guidance for Direct Domestic Use of Extremely Impaired Sources*, CDPH Policy Memorandum 97-005 ("CDPH 97-005"), which establishes a specific process for the evaluation of, and selection of treatment systems for, impaired water sources before they can be approved for use as drinking water.

1.3.3 Guidance and Reference Material

The Settling Defendants shall comply with all guidance issued by EPA for conducting RD/RA and the activities described herein, to the extent deemed appropriate by EPA. A list of primary guidance and reference material is attached (Attachment 3). In all cases, the Settling Defendants shall use the most recently issued guidance, as appropriate.

In addition, Settling Defendants shall implement EPA's *Greener Cleanups Policy - EPA REGION 9*, issued September 14, 2009. EPA Headquarters is also finalizing additional guidance on its "Superfund Green Remediation Strategy", which shall be consulted and followed.

1.3.4 Communication

The primary EPA contact for activities to be conducted pursuant to this Statement of Work is the EPA Project Coordinator, Kelly Manheimer, (415) 972-3290, manheimer.kelly@epa.gov.

The alternate contact is Fred Schauffler, Chief of California Site Cleanup Section I, (415) 972-3174, schauffler.frederick@epa.gov.

The LADWP contact is **TBD**

The California Department of Toxic Substances Control ("DTSC") contact is Poonam Acharya, (818) 717-6558, pacharya@dtsc.ca.gov

1.3.5 EPA Oversight

EPA will provide oversight of the Settling Defendants' activities throughout the RD/RA and performance of the Work. EPA will review deliverables to ensure that the RD/RA and all Work correctly identifies and achieves the ROD Performance Standards and other requirements of the ROD, the Consent Decree, and this SOW. Notwithstanding any action by EPA, Settling Defendants remain fully responsible for achieving the Performance Standards and other provisions and requirements of the ROD, the Consent Decree, and this SOW. Nothing in the Consent Decree, this SOW, EPA's approval of the RD, RA, or any other submission, shall be deemed to constitute a warranty or representation of any kind by EPA that full performance of the RD and RA will achieve the ROD Performance Standards. Settling Defendants' compliance with submissions approved by EPA does not foreclose EPA from seeking additional work to achieve the applicable Performance Standards.

1.3.6 Timeframes, Deliverables Review

The timeframes and deadlines for the submission of each deliverable are listed in Attachment 2. The "EPA Estimated Review Period" specified in Attachment 2 is set by EPA as a goal. EPA will strive to achieve this goal to keep the project on schedule. However, if EPA is unable to meet one or more of these review periods, and deliverables from the Settling Defendants are affected by EPA's delay, the deadlines for those deliverables will be modified to reflect such delay.

All deliverables will be submitted for review in accordance with Section X of the CD and will either be approved or disapproved by EPA. If EPA disapproves the deliverable and requests modifications, the Settling Defendants shall revise the deliverable and resubmit it to EPA, as provided in Section X of the CD. After Settling Defendants' receipt of EPA comments on any draft document, if any, Settling Defendants shall submit for EPA review and approval a final document within 15 days of receipt of such comments, or other due date as specified in EPA's comment letter. Other than the timeframe for Settling Defendants' submittal, EPA's review and approval shall be in accordance with Section X of the CD. The Settling Defendants shall submit the major deliverables using a form approved by EPA.

2.0 Project Planning and Support

The purpose of this task is to determine how the site-specific Performance Standards will be satisfied. The following activities shall be performed as part of the project planning and support task:

2.1 Personnel

As required in Section VI of the CD, Settling Defendants shall notify EPA within ten days of the lodging of the CD of the name, title, and qualifications of the Supervising Contractor that Settling Defendants will retain to perform the Work. Settling Defendants shall also provide EPA with a copy of the Supervising Contractor's Quality Management Plan ("QMP").

Settling Defendants shall demonstrate that the proposed contractor has a quality assurance system that complies with ANSI/ASQC E4-1994, "Specifications and Guidelines for Quality Systems for Environmental Data Collection and Environmental Technology Programs" (American National Standard, January 5, 1995), by submitting a copy of the proposed contractor's QMP. The QMP should be prepared in accordance with "EPA Requirements for Quality Management Plans (QA/R-2)" (EPA/240/B-01/002, March 2001, reissued May 2006) or equivalent documentation as determined by EPA.

In addition, Settling Defendants shall identify an individual who shall be responsible for ensuring that each phase of the project is reviewed to identify the most sustainable path that is appropriate for the project. Best sustainable practices shall be reviewed for appropriate inclusion, including Leadership in Energy and Environmental Design ("LEED"), LCA, etc. To the extent practicable, all carbon emissions shall be offset, so that the entire project is carbon neutral, or negative, preferably with internally generated credits.

2.2 Develop Site-Specific Plans

The Settling Defendants shall obtain and evaluate existing data and documents pertinent to the implementation of the ROD. This information shall be used to determine if additional data are needed for RD implementation.

The Settling Defendants shall prepare and submit for EPA approval the other site-specific plans specified in this SOW, in accordance with the approved Remedial

Design (“RD”) and Remedial Action (“RA”) Work Plans. The following describes the site-specific plans that are required.

2.2.1 Health and Safety Plan/Contingency Plan

A site-specific Health and Safety Plan (“HASP”) must specify how workers will be protected during any site activities through the identification, evaluation, and control of health and safety hazards. The HASP shall be in conformance with U.S. Occupational Safety and Health Administration requirements in Title 29 of the Code of Federal Regulations (“CFR”) (sections 1910 and 1926), and any other applicable requirement(s). The contingency plan portion of the HASP shall specify the actions to be taken to protect the local community in the event of an accident or emergency. EPA will review, but will neither approve nor disapprove, the HASP. Each of Settling Defendants’ employees, and contractors, etc., is responsible for ensuring that its workers follow applicable federal and State worker health and safety regulations. Contingency plans shall be posted at a visible location during all field work.

2.2.2 Sampling and Analysis Plan

The Sampling and Analysis Plan (“SAP”) shall address all of the groundwater monitoring activities described below in Section 2.2.3 and any additional field activities that the Settling Defendants determine, and EPA approves, are required to implement the Work. The SAP shall include a Quality Assurance Project Plan (“QAPP”), a Field Sampling Plan (“FSP”), and a schedule for implementation of sampling, analysis, and reporting activities. Upon EPA approval of the SAP, the Settling Defendants shall proceed to implement the sampling activities described in the SAP.

- Quality Assurance Project Plan. The QAPP must be prepared in accordance with the *EPA Requirements for Quality Assurance Project Plans for Environmental Data Operations*, and with the *EPA Guidance on Systematic Planning Using the Data Quality Objectives Process* and other applicable guidance (see Attachment 3). The QAPP shall describe project objectives, organizational and functional activities, data quality objectives (“DQOs”), and quality assurance and quality control (“QA/QC”) protocols that shall be used to achieve the desired DQOs. The DQOs shall, at a minimum, reflect use of analytical methods for obtaining data of sufficient quality to meet National Contingency Plan requirements as identified at 40 CFR 300.435(b). In addition, the QAPP shall address personnel qualifications, sampling procedures, sample custody, analytical procedures, document control procedures, preservation of records (see CD Sections VII, XXIV), data reduction, data validation, data management, procedures that will be used to enter, store, correct, manipulate, and analyze data. It shall also include protocols for transferring data to EPA in electronic format, and document management. The QAPP shall provide sufficient detail to demonstrate that:
 - The project technical and data quality objectives are identified;

- The measurements or data acquisition methods are appropriate for achieving project objectives;
- Assessment procedures are sufficient for confirming that data of the type and quality needed and expected are obtained; and,
- Any limitations on the use of the data are identified and documented.

All analytical data, whether or not validated, shall be submitted to the EPA within 60 calendar days of sample shipment to the laboratory, or 14 days of receipt of analytical results from the laboratory, whichever occurs first. All analytical data shall be validated and submitted to EPA in an approved electronic format within 90 calendar days of the sample shipment to the laboratory. Well construction information shall be submitted to EPA at the completion of the initial sampling activities, or within 90 days after completion of a well, whichever is earlier.

- Field Sampling Plan. The FSP must be in accordance with the regional guidance document *EPA Region IX Sampling and Analysis Plan Guidance and Template* (R9QA/002.1, April, 2000); and other applicable guidance (see Attachment 3). The FSP shall describe sampling objectives, analytical parameters, analytical methods, sampling locations and frequencies, analytical holding times, sampling procedures and equipment, sample preservation, sample packing, QA/QC samples, sample paperwork and chain-of-custody procedures, sample handling and shipping, management of investigation-derived wastes, and planned uses of the data. The FSP must define the sampling and data collection methods that will be used for a project. The FSP shall be written so that a field sampling team unfamiliar with the project would be able to gather the samples and field information required. The FSP shall include a schedule that describes activities that must be completed in advance of sampling, including acquisition of property, access agreements, and arrangements for disposal of investigation-derived waste.

2.2.3 Groundwater Monitoring Plan

Settling Defendants shall take over the quarterly monitoring of the current EPA groundwater monitoring well network within the NHOU, and shall submit a Groundwater Monitoring Plan to implement this work, in accordance with the schedule identified in Attachment 2. The groundwater monitoring shall be implemented upon EPA approval of the Groundwater Monitoring Plan. The schedule for the monitoring shall coincide, and be coordinated, with the quarterly Basin-wide monitoring conducted by EPA's contractor, or other PRP groups at other SFV sites.

The Groundwater Monitoring Plan shall also address the NHOU-specific monitoring activities necessary to demonstrate that Performance Standards are being met by the remedy, as well as to address any additional data gaps identified by the PRPs. Monitoring activities shall be performed in accordance with the approved Groundwater Monitoring Plan to:

- continue to monitor groundwater flow conditions and contaminant migration within the NHOU; and,
- evaluate whether the performance standards, as described in Section 1 of this SOW, and in the ROD, are being met, as demonstrated following the procedures outlined in EPA's guidance document: *A Systematic Approach for Evaluation of Capture Zones at Pump and Treat Systems*.

The activities will include identification of performance monitoring wells, as well as sampling from these wells and other monitoring wells, extraction wells, and the treatment systems. A revised SAP will be prepared in support of all fieldwork to be conducted according to the Groundwater Monitoring Plan.

To the extent practicable, any Settling Defendant that is currently conducting source control work at a facility in the NHOU under RWQCB or DTSC order, or otherwise, shall work with the appropriate oversight agency to coordinate times for groundwater quality and water level sampling to coincide with the area-wide events described herein.

The Groundwater Monitoring Plan shall be amended as necessary over the life of the activities conducted pursuant to this SOW and CD, and in particular with the RA Work Plan described below in Section 8.2.

The Groundwater Monitoring Plan shall address the following requirements:

- Data Collection Parameters: specify the locations of monitoring wells, as well as specify sampling and monitoring methods and a sampling and monitoring frequency. It is expected that, initially, all groundwater monitoring wells will be sampled quarterly.
- Identify monitoring wells, sentinel wells, and compliance wells.
- Computer Modeling: perform hydraulic and contaminant transport modeling simulations of groundwater flow and contaminant migration to indicate whether the RD will sufficiently contain the groundwater contamination during all anticipated pumping and recharge conditions (i.e., demonstrating that simulated particles originating in contaminated areas converge into the extraction wells). Modeling shall also be used to propose and evaluate modifications to the extraction plan, if needed, using an appropriate three-dimensional, time-varying model of groundwater flow. When establishing extraction capture zones, the Settling Defendants shall follow the guidelines described in the EPA guidance document: *A Systematic Approach for Evaluation of Capture Zones at Pump and Treat Systems*.

Hydraulic modeling has been performed on many occasions during the site history, and most recently for EPA's *Focused Feasibility Study*. The Settling Defendants shall submit to EPA any proposed changes in modeling assumptions, and discuss their effect on recommended

extraction rates and well locations. The Groundwater Monitoring Plan shall describe the model calibration approach and assumptions. All models must be calibrated and approved by EPA prior to use.

- **Contingency Action:** the Groundwater Monitoring Plan shall propose contingency plans to be used in the event that sampling results in the sentinel wells located on the edges of the plume indicate unexpected increases in COC concentrations. Contingency actions could include increases in monitoring frequency, installation of additional groundwater monitor wells in the impacted areas, and/or adjustment of groundwater extraction locations or rates.
- **Well Discharge:** Settling Defendants shall measure flow rates at each extraction well (and calculate volumes of water extracted) as a function of time, using a meter/totalizer installed on the discharge pipe for each extraction well. The reading on the meter/totalizer shall be recorded at least quarterly and whenever water quality samples are collected from that well.
- **Data Reporting:** The Groundwater Monitoring Plan shall propose electronic reporting formats to support submittal of all groundwater data to the EPA, which must be consistent with EPA's San Fernando Valley database.
- **Contaminant Mass Removal:** Settling Defendants shall calculate the mass of individual contaminants removed from the SFV by each extraction well each quarter, and cumulatively.
- **Data Analysis and Reporting:** The Groundwater Monitoring Plan shall also describe how the performance data will be analyzed, interpreted, and reported to evaluate compliance with ARARs and the Performance Standards. All data shall be submitted by the deadlines approved in the SAP. Claims of change, difference, or trend in water quality or other parameters (e.g., between observed values and an ARAR) shall include the use of appropriate statistical concepts and tests.

2.2.4 Remedial Design Quality Assurance Plan

A RD QAPP shall be submitted to EPA for review and approval. This plan shall describe the quality control activities that Settling Defendants will implement to ensure that the RD is conducted in an effective and compliant manner.

2.3 Project Status Reports and Meetings

2.3.1 Weekly Project Status Update

The Settling Defendants shall prepare and submit weekly electronic Project Status Updates to EPA and DTSC that briefly document the progress and current status of each task required by this SOW and approved RD and RA Work Plan. Each update should consist of a simple tracking form for the tasks,

a narrative of problems arising, and description of steps planned or underway to mitigate them. In addition, weekly teleconferences may be scheduled to review the progress during particularly active times, at the discretion of the EPA Project Coordinator. These meetings may be held in person, at the discretion of the EPA Project Coordinator.

2.3.2 Monthly Progress Report

In addition, the Settling Defendants shall prepare and submit written Monthly Progress Reports that:

- (a) describe the actions which have been taken toward achieving compliance with the requirements of this SOW and CD during the previous month;
- (b) include a summary of all results of sampling and tests and all other data received or generated by Settling Defendants in the previous month;
- (c) identify all plans, reports, and other deliverables required by this SOW and CD completed and submitted during the previous month;
- (d) describe all actions, including, but not limited to, data collection and implementation of work plans, which are scheduled for the next six (6) weeks and provide other information relating to the progress of the design, construction, and implementation activities, including, but not limited to, critical path diagrams, Gantt charts and Pert charts;
- (e) include information regarding percentage of completion, unresolved delays encountered or anticipated that may affect the future schedule for implementation of the work, and a description of efforts made to mitigate those delays or anticipated delays; and,
- (f) include any modifications to the work plans or other schedules that Settling Defendants have proposed to EPA or that have been approved by EPA.

If requested by EPA, Settling Defendants shall also provide briefings for EPA to discuss the progress of the Work.

2.3.3 Progress Meetings

The Settling Defendants shall consult with EPA during the design and construction process, and shall discuss and obtain approval for critical decisions in meetings and conversations with EPA. Following such meetings and conversations, Settling Defendants shall prepare and submit for EPA approval, draft meeting summary notes within five (5) days of the discussion. Settling Defendants shall document all decisions made and rationale for those decisions. Meeting notes shall include appropriate layout and design drawings or figures used in the meetings. The meeting summary deliverable shall be factual and shall present any technical disputes in an unbiased manner.

2.3.4 Annual Performance Evaluation Report

At the end of each fiscal year (September 30), Settling Defendants shall provide an Annual Performance Evaluation Report. The format and exact content of the updates and reports shall be determined in the RD and RA

Work Plans. The Annual Performance Evaluation Reports shall include but not be limited to a review of how the system is working and any recommended changes or modifications to the system, as well as any projected operational timelines.

3.0 Community Relations Support

The Settling Defendants shall provide community relations support to EPA throughout the performance of the Work under this CD consistent with Section XXVIII of the CD and in accordance with the *Superfund Community Involvement Handbook*, April 2005. Community relations support may include the following subtasks:

Fact Sheet Preparation Assistance: The Settling Defendants shall, at EPA's request, assist with the preparation of fact sheets that inform the public about activities related to the remedial design, the schedule for RA, activities to be expected during construction, provisions for responding to emergency releases and spills, and any potential inconveniences such as excess traffic and noise that could affect the community during the RA.

Technical Support: The Settling Defendants shall, at EPA's request, provide technical support for community relations, which may include providing technical input to news releases, fact sheets, briefing materials, and other community relations vehicles.

Public Meeting Support: The Settling Defendants shall, at EPA's request, prepare presentation materials and provide logistical support for public meetings and open houses.

Public Notice: The Settling Defendants shall, at EPA's request or as otherwise needed, provide individual notice to residents in the vicinity of areas where work will be performed by the Settling Defendants.

Reporting: The Settling Defendants shall, at the request of EPA, provide verbal status reports concerning the work performed by the Settling Defendants.

Report Copies: The Settling Defendants shall, at the request of EPA, provide extra copies for the public of final deliverables or other documents produced pursuant to this Statement of Work.

4.0 Environmental Sample and Data Acquisition

Environmental sample acquisition entails collecting environmental samples and information required to support the Work. The planning for this task, including the scheduling, shall be accomplished in accordance with Section 2.2.2 (SAP) of this SOW, and shall result in the plans and timeframes required to collect the field data. Sample acquisition starts with EPA approval of the SAP and continues on a routine frequency (as defined in the SAP) until the Work performed under the CD is completed. The Settling Defendants shall perform the following field activities or combination of activities for sample acquisition in accordance with the EPA-approved SAP:

4.1 Mobilization and Demobilization

Provide the necessary personnel, equipment, and materials for mobilization and demobilization to and from the NHOU for the purpose of conducting the sampling

program approved in the SAP. Coordinate with and allow EPA to conduct split sampling whenever requested by EPA.

4.2 Field Investigation

Conduct environmental sampling / field investigations as described in the EPA-approved SAP.

4.3 Sample Analysis

The Settling Defendants shall arrange for and carry out the analysis of environmental samples, collected during the previous task, according to the SAP approved by EPA. The sample analysis task begins with arranging the sample analysis work with a qualified laboratory and after completion of the field sampling program. This task ends with the Settling Defendants verifying that the laboratory has completed the requested analyses and has submitted sample data packages for full third party validation (Region 9 Tier 3) per the frequency defined in the approved monitoring specific QAPP. Normally this would be 20% for routine monitoring.

The Settling Defendants shall demonstrate in advance and to EPA's satisfaction that each laboratory used is qualified to conduct the proposed work and satisfies the requirements specified in Section VII of the CD. EPA may require that the Settling Defendants submit detailed information to demonstrate that the laboratory is qualified to conduct the work, including information on personnel qualifications, equipment and material specification, and laboratory analyses of performance samples (blank and/or spike samples). In addition, EPA may require submittal of data packages equivalent to those generated by the EPA Contract Laboratory Program. Electronic data deliverables shall be submitted to EPA.

4.4 Analytical Support and Data Validation

The Settling Defendants shall arrange for and carry out third party data validation of the analytical data received from the laboratory during the previous task, according to the approved SAP. For purposes of this SOW, "third party" is defined as any party other than the entity managing or performing the monitoring activities. The data validation task begins with the Settling Defendants transmitting all sample data packages received from the laboratory to the third party for validation in accordance with *USEPA Contract Laboratory Program National Functional Guidelines for Superfund Organic Methods Data Review*, and *USEPA Contract Laboratory Program National Functional Guidelines for Low Concentration Organic Data Review*. This task ends with the Settling Defendants providing EPA with data validation reports for the analytical data received from the laboratory.

4.5 Data Evaluation

The Settling Defendants shall organize and evaluate both pre-existing data and data gathered as part of this SOW; such data will be used later in the RD/RA effort. This work shall be performed in accordance with the EPA-approved SAP. The EPA *Guidance for Data Quality Assessment, Practical Methods for Data Analysis* should also be consulted for this operation. Data evaluation for each sampling event begins with the receipt of validated analytical data and ends with the submittal of the Data

Evaluation Summary Report described below. Specifically, the Settling Defendants shall perform the following activities or combination of activities during the data evaluation effort:

4.5.1 Data Usability Evaluation and Field QA/QC

4.5.2 Data Reduction, Tabulation, and Evaluation

Tabulate, evaluate, and interpret the data. Present data in an appropriate format for final data tables. Design and set up an appropriate database for pertinent information collected that will be used during the performance of the Work. Submit electronic database in a format compatible with EPA's existing database (to enable efficient import into that system), and processed data tables to EPA along with each Data Evaluation Summary Report.

4.5.3 Development of Data Evaluation Report

Settling Defendants shall evaluate and present results in a Data Evaluation Report, which shall be submitted to EPA for review and approval, within 90 days of the completion of each monitoring or sampling event. Sufficient information must be provided in this report to enable EPA to assess the adequacy of the work performed.

5.0 Remedial Design

5.1 Develop RD Work Plan

The Settling Defendants shall submit a draft RD work plan, in accordance with the schedule in Attachment 2. The deliverables and schedule approved by EPA in the final RD Work Plan shall become requirements of this SOW and the CD.

Design/Construction Approach:

Settling Defendants shall indicate if they are interested in pursuing a conventional design/bid/build strategy, or the design/build approach to design and construction. The conventional design/bid/build approach is one in which the design is taken to the 100 percent completion level to allow contractor bidding of the construction work. The design/build approach is one in which the design is developed to about the 60 percent completion level followed by subsequent field engineering during construction. EPA will indicate preliminary approval of the approach as part of RD Work Plan approval. The final decision will be made with the approval of the Preliminary Design.

The RD Work Plan shall include the following information:

- **Project Description:** A statement of the problem and any potential problems posed by the site and how the objectives of the RD will address these problems. A discussion of the proposed extraction and treatment options to be evaluated and the approach in evaluating the options.
- **Background:** A background summary setting forth:

- A brief description of the NHOU including any geographic, physiographic, hydrologic, geologic, demographic, ecological, cultural, or natural resource features that are relevant to the RD.
- A brief synopsis of the history of the area including a summary of past disposal practices and a description of previous responses that have been conducted by local, state, federal, or private parties at the NHOU.
- A summary of the existing data including physical and chemical characteristics of the contaminants identified and their distribution among the environmental media at the NHOU.
- Scope of Work: A discussion of the detailed scope of work to be performed during the RD.
- RD Team Organization and Coordination: A discussion and organizational charts for the Settling Defendants' organization, the RD project organization, coordination and communications procedures, and a discussion of the roles and responsibilities of the RD team. The Settling Defendants shall identify any subcontractors it plans to use to accomplish all or part of any task identified.
- RD Project Schedule: The schedule shall include, but not be limited to, all design deliverables listed in Attachment 2 of this SOW.
- Permits, Access and Third Party Agreement(s): Any and all permits, property leases, and/or easements required for implementation of the RD, as well as a discussion of the substantive permit requirements, schedule of permit applications, property acquisitions, and third party agreements. This shall include planning for the CDPH 97-005 process, as referenced above in Section 1.3.2 of this SOW.
- Site Management: a description of how access, security, management responsibilities, decontamination, and waste disposal are to be handled during RD.
- Sustainability Approach: a thorough description of the process or plans to be implemented by the Settling Defendants to ensure that the entire project is managed in the most sustainable manner possible.
- Description of Deliverables: The RD Work Plan shall include plans for the completion of all the deliverables identified below. In addition, the RD Work Plan shall present the technical and management approach to each task to be performed, including: a detailed description of each task; the assumptions used; the identification of any technical uncertainties (with a proposal for the resolution of those uncertainties); the information needed for each task; any information to be produced during and at the conclusion of each task; and a description of the deliverables that will be submitted to EPA. These deliverables include:
 1. Health and Safety Plan/Contingency Plan ("HASP");
 2. Sampling and Analysis Plan ("SAP");
 3. Groundwater Monitoring Plan;

4. Remedial Design Quality Assurance Project Plan (“RD QAPP”);
5. Monthly Progress Reports;
6. Data Evaluation Report (if additional data is needed prior to, or during, design – see section 4.5);
7. Preliminary design report (30%);
8. Pre-Achievement O&M Plan;
9. Intermediate design report (60%); and,
10. Prefinal/final design report (if applicable).

The Settling Defendants shall also identify any additional deliverables believed necessary, and include a schedule for the submission of these deliverables.

5.2 Approval of the RD Work Plan

The draft RD Work Plan will be submitted for review in accordance with Sections VI and X of the CD. Settling Defendants shall submit a final RD Work Plan within 15 days of receipt of any EPA comments on the draft RD Work Plan. Upon approval of the final RD Work Plan by EPA, Settling Defendants shall implement the RD.

5.3 Preliminary Design

The Settling Defendants shall conduct Preliminary Design activities in accordance with the RD Work Plan and Attachment 2 of this SOW. Remedial Design activities shall include the preparation of clear and comprehensive design documents, construction plans and specifications, and other design activities needed to implement the Work and satisfy all Performance Standards set forth in the ROD. All plans and specifications shall be developed in accordance with relevant portions of the EPA Remedial Design/Remedial Action Handbook, and in accordance with the schedule set forth in the approved RD Work Plan.

The components that constitute the Preliminary Design are described below and shall be submitted to EPA for review and approval in accordance with Sections VI and X of the CD, unless otherwise provided herein. Preliminary Design begins with the initial design and ends with the completion of approximately 30 percent of the design effort. The Settling Defendants shall include the following components in the Preliminary Design:

5.3.1 Design/Construction Approach

If EPA preliminarily approved the design/build approach with the approval of the RD Work Plan, Settling Defendants shall include a final request to perform design/build for any or all of the design and construction with the Preliminary Design. The Preliminary Design will then outline the approach to contracting and quality control in a more thorough manner.

5.3.2 Design Criteria

The Design Criteria shall define in detail the technical parameters upon which the design will be based. Specifically, the Design Criteria shall include the preliminary design assumptions and parameters, including, as appropriate:

- Waste characterization;
- Volume and types of each medium requiring treatment;
- Assumed treatment plant influent quality over the design life of the treatment system(s), with a description of the methodology used to develop the estimate (including discussion of the likelihood and magnitude of short-term and long-term changes in influent concentrations);
- Treatment schemes (including all media and byproducts), rates, and required qualities of waste streams (i.e., input and output rates, influent and effluent qualities, potential air emissions, etc.);
- Filtration, disinfection, corrosion control, or other treatment requirements in addition to removal of site contaminants;
- Delivery locations, rates, and pressures for the treated groundwater, and other conveyance system assumptions for supplying treated groundwater;
- Description of how the design will achieve Performance Standards;
- Long-term operation and maintenance (“O&M”) and performance monitoring requirements;
- An LCA evaluation for all components of the system and a method for minimizing or offsetting impacts, including all carbon emissions;
- Preliminary demonstration of plume capture, consistent with EPA’s guidance: *A Systematic Approach for Evaluation of Capture Zones at Pump and Treat Systems*;
- All ARARs, pertinent codes, and standards to be complied with; and,
- Technical factors of importance to the design and construction including use of currently accepted environmental control measures, constructability of the design, end-use of land, and use of currently acceptable construction practices and techniques.

5.3.3 Preliminary Delivery Plan and Schedule

The Delivery Plan and Schedule shall describe how the RA is to be delivered, how contracting shall be done, the contracting strategy (conventional 100 percent design-bid-build versus design-build), the organizational structure, communication strategy, etc. The schedule shall include an evaluation of a phased approach to expedite the RA. The contracting strategy shall be carefully described.

For a conventional design-bid-build approach, all four phases of design including Preliminary Design (approximately 30 percent design completion), Intermediate Design (approximate 60 percent completion), Prefinal Design (approximately 90 percent completion) and Final Design (100 percent completion) shall be required to facilitate bidding of the construction work and commencement of the construction work itself. In addition, as-built

drawings shall be required at the end of construction, which shall be provided with the RA Completion Report (see Section 6.8 of this SOW).

5.3.4 Preliminary Construction Schedule

A preliminary RA schedule appropriate to the size and complexity of the project shall be included in the Preliminary Design.

5.3.5 Specifications Outline

The general specifications outline shall include all specification sections to be used. The format and organization shall be consistent with the Construction Specification Institute (“CSI”) format.

5.3.6 Preliminary Drawings and Specifications

The drawings and schematics shall reflect organization and clarity. This submittal should include the following:

- An outline or listing of the drawings and schematics;
- Facility representations including a process flow diagram and a preliminary piping and instrumentation diagram;
- A general arrangement diagram; and,
- Site drawings, consisting of engineering drawings submitted in 11-inch x 17-inch sheets (or larger with approval from the EPA Project Coordinator).

5.3.7 Basis of Design

The Basis of Design shall include a detailed description of the evaluations conducted to select the design approach. It shall include a Summary and Detailed Justification of Assumptions, which shall include:

- Calculations supporting the assumptions;
- A draft process flow diagram;
- Detailed evaluation of how all ARARs will be met;
- A plan for minimizing environmental and public impacts; and,
- A plan for satisfying any permitting requirements, including a status update of the progress of the CDPH 97-005 process.

5.3.8 Easement and Access Requirements

The potential need for land acquisition for access, or any other access or easement issues or requirements shall be identified.

5.3.9 Value Engineering Screening (Optional)

The Settling Defendants may choose to perform Value Engineering (“VE”) screening that shall include an evaluation of cost and function relationships, concentrating on high-cost areas. The VE screening shall be performed by an independent Value Engineering group. An “Independent Value Engineering

group” is defined as any qualified party other than the individuals that performed the design. However, as necessary, selected individuals from the design team may also participate in the VE screening. The outcome of the screening shall be a recommendation for or against a full-scale VE study based on the potential for cost savings as a result of design changes. VE screening can be performed at the discretion of the Settling Defendants. However, any decisions made as a result of any VE effort that could impact the design of the remedy shall be submitted to EPA for approval.

5.4 Intermediate Design

The Settling Defendants shall conduct Intermediate Design activities in accordance with the RD Work Plan and the requirements identified below. Intermediate Design activities shall include the preparation of clear and comprehensive design documents, construction plans and specifications, and other design activities needed to implement the work and satisfy all Performance Standards set forth in the ROD. All plans and specifications shall be developed in accordance with relevant portions of the EPA Remedial Design/Remedial Action Handbook, and in accordance with the schedule set forth in the approved RD Work Plan, and Attachment 2 of this SOW.

The components that constitute the Intermediate Design are described below and shall be submitted to EPA for review and approval in accordance with Sections VI and X of the CD and Attachment 2 to this SOW. Intermediate Design begins with completion of the Preliminary Design and ends with the completion of approximately 60 percent of the design effort. The level of the Intermediate Design may vary, depending on whether the Settling Defendants propose and EPA approves, to complete the project on a design/bid/build or design/build basis. The Intermediate Design shall address all prior EPA comments on the Preliminary Design, or provide a memorandum explaining why specific comments were not incorporated or addressed.

The Settling Defendants shall include in the Intermediate Design, at a minimum, the following components:

5.4.1 Update of Construction Schedule

The schedule for implementation of the RA shall identify the timing for initiation and completion of all critical path tasks. The schedule shall specifically identify duration for completion of the project and major milestones.

5.4.2 Intermediate Specifications

Plans and specifications shall conform to acceptable standards and shall be formatted in accordance with CSI requirements. Plans and specifications shall include preliminary specifications for construction, installation, site preparation, and fieldwork standards and performance monitoring.

5.4.3 Intermediate Drawings

Intermediate Drawings shall include an outline or listing of drawings, facility representations containing a process flow diagram, a piping and instrumentation diagram with a control logic table, and continuations and

expansions of drawings submitted with the preliminary plans and specifications. The Intermediate Drawings shall also include engineering drawings for grading/paving, foundation, extraction wells and wellheads, piping, electrical, structural, mechanical, instrumentation, and monitoring systems, as appropriate.

5.4.4 Revised Basis of Design

The revised Basis of Design shall include a revised summary of the evaluations conducted to select the design approach. This summary shall include any additions made to the Basis of Design, as presented in the Preliminary Design.

5.4.5 RA Contracting Strategy

The contracting strategy shall describe the management approach for procuring the RA contractor, including procurement methods, phasing alternatives, and contractor and equipment availability concerns.

5.4.6 Updated Identification of Easement and Access Requirements

The need for land acquisitions for access and easement requirements shall be updated, as appropriate, as part of the Intermediate Design.

5.4.7 Identification of the Projected O&M Requirements and Annual Costs

The Settling Defendants shall identify the projected O&M requirements, including performance monitoring, and develop an estimate of the annual O&M costs.

5.4.8 VE Study and Report Recommendations

If recommended by the preliminary VE screening, the VE Study shall be conducted and the report prepared and submitted by an independent Value Engineering group. However, any decisions made as a result of any VE effort that could affect the design of the remedy shall be submitted to EPA for approval. This task is optional, and shall be done at the discretion of the Settling Defendants.

5.5 Prefinal and Final Design

The Settling Defendants shall conduct Prefinal and Final Design activities in accordance with the RD Work Plan and the approved schedule.

- These design activities shall be performed if the construction approach uses a conventional design/bid/build strategy in which the design is taken to the 100 percent completion level to allow contractor bidding of the construction work.

- If a design/build approach is utilized in which the design is developed to about the 60 percent completion level followed by subsequent field engineering during construction, then prefinal and final design activities would not be required. In this case, the as-built drawings will serve as the final design drawings. In addition, the 60 percent design package shall be revised to fully address all EPA comments on the Preliminary and Intermediate Design submittals and re-submitted for EPA approval.

The following discussion and requirements would be applicable if the design/bid/build approach is approved, and prefinal and final design activities are performed.

5.5.1 Prefinal Design

The Prefinal Design shall fully address all comments made on the Preliminary and Intermediate design submissions, and, if not previously addressed, be accompanied by a memorandum indicating how the comments were incorporated into the Prefinal Design. The Prefinal Design submittal shall include an updated capital and O&M cost estimate, reproducible drawings and specifications, and a complete set of construction drawings in one-half-size reduction (11-inch by 17-inch size).

The components and deliverables that constitute the Prefinal and Final Design are described below and shall be submitted to EPA for review and approval in accordance with Section X of the CD, and Attachment 2 to this SOW. The Prefinal Design shall clearly show any modifications to the design resulting from the Intermediate Design review, if any such Intermediate Design deliverables were required by EPA subsequent to such review. EPA will review the Prefinal Design in accordance with Section X of the CD.

5.5.2 Final Design

Within 30 days after EPA approves the Prefinal Design, Settling Defendants shall submit all Final Design deliverables to EPA. All Final Design documents shall be approved and stamped by a Professional Engineer registered in California. EPA approval of the Final Design, including the Final Draft O&M Plan and the Final Construction Quality Assurance Plan, is required before initiating the RA, unless specifically authorized otherwise by EPA.

The Settling Defendants shall include the following components in the Prefinal and Final Designs:

5.5.3 Specifications

A complete set of construction specifications shall be submitted at the prefinal stage. All specifications shall conform to CSI format. If the Value Engineering study is conducted, the VE report recommendations that have been approved by EPA shall be incorporated into the Prefinal Design specifications. The specifications must be consistent with the technical requirements of all ARARs and must meet all ARARs, Performance Standards, and other provisions and requirements of the ROD, the CD, and the

SOW. Any offsite response activities shall be in compliance with Section 121(d)(3) of CERCLA, 42 U.S.C. Section 9621(d)(3), 40 C.F.R. 300.440, and other applicable guidance. Before submitting the project specifications, the Settling Defendants shall coordinate and cross-check the specifications and drawings.

5.5.4 Drawings

A complete set of construction drawings shall be submitted in the 11-inch x 17 -inch size. Value Engineering report recommendations (submitted as part of the Intermediate Design) that have been approved by EPA shall be incorporated into the Prefinal Design drawings.

5.5.5 Basis of Design

A Basis of Design that incorporates any changes made since the Intermediate Design shall be submitted.

5.5.6 Delivery Plan and Schedule

The Delivery Plan shall incorporate any changes made since the Preliminary Delivery Plan and Schedule. The Final Design should also include a schedule for construction completion and the other construction and operational milestones identified in this SOW.

5.5.7 Report of VE Modifications

A Report of VE Modifications shall be submitted that describes the changes made to the final designs as a result of the VE Study and Recommendations, if conducted.

5.6 Operation and Maintenance Plan

“Pre-Achievement O&M” shall mean: (1) all operation and maintenance activities required for the Remedial Action to achieve Performance Standards, as provided under the Pre-Achievement O&M Plan approved or developed by EPA pursuant to Section VI (Performance of the Work by Settling Defendants) and the SOW; and, (2) maintenance, monitoring, and enforcement of Institutional Controls as provided in the ICIAP, until Performance Standards are met.

“Post-Achievement O&M” shall mean: (1) all activities required to maintain the effectiveness of the Remedial Action after Performance Standards are met, as required under the Post-Achievement O&M Plan approved or developed by EPA pursuant to Section VI (Performance of the Work by Settling Defendants) and the SOW; and, (2) maintenance, monitoring, and enforcement of Institutional Controls after Performance Standards are met, as provided in the ICIAP.

Settling Defendants shall submit a draft Pre-Achievement O&M Plan for EPA’s review, in accordance with Sections VI and X of the CD, and in accordance with Attachment 2 of this SOW. Once approved by EPA, this document will be considered the Final Pre-Achievement O&M Plan. The Final Post-Achievement O&M Plan will be submitted upon completion of remedial action construction.

O&M Plans shall describe, among other things, the compliance monitoring that will be conducted to measure the performance of the system in achieving and maintaining the Performance Standards described in the ROD. At a minimum, all the manuals shall include the following:

5.6.1 Description of Equipment

A description of equipment including: the equipment identification numbers; identification and description of installed monitoring components; maintenance needs and schedules of site equipment; material requirements; anticipated equipment replacement for significant components; availability of spare parts; and, replacement schedule for equipment and installed components.

5.6.2 Description of O&M

A description of routine and emergency O&M tasks, including startup and shutdown procedures, prescribed treatment or operation conditions, and schedule for each O&M task. In addition, a description of provisions for remote monitoring and control, operator training and certification requirements, staffing needs, and related requirements.

5.6.3 Description of Potential Operating Problems

A description and analysis of potential operating problems, including common and/or anticipated remedies and useful-life analysis of significant components and replacement costs.

5.6.4 Compliance Monitoring Sampling and Analysis Plan

A description of the compliance monitoring strategy and tasks, location of the points of compliance monitoring, required data collection, and a description of required laboratory tests and their validation and interpretation. (See Section 2.2.3, Sampling and Analysis Plan, for more information). It shall also include criteria for determining when the Performance Standards have been met, and Remedial Action is complete, as well as other indicators of system performance and/or maintenance (e.g., parameters to be monitored to determine timing for activated carbon replacement, etc.).

5.6.5 Waste Disposal

A description of the plans for the proper disposal of materials used and wastes generated during the O&M periods (e.g., extracted groundwater, protective clothing, spent treatment media, and disposable equipment). These provisions shall be consistent with the off-site disposal requirements of Superfund Amendments and Reauthorization Act, the Resource Conservation and Recovery Act, and applicable state laws. The Settling Defendants, their authorized representative, or another party acceptable to the EPA shall be identified as the generator of wastes for the purpose of regulatory or policy compliance.

5.6.6 Health and Safety Plan for O&M

A description of precautions and necessary equipment for site personnel, safety tasks required in event of systems failure, and safety tasks necessary to address protection of nearby residents and LADWP's drinking water.

5.6.7 Records and Reporting Mechanisms

A description of records and reporting mechanisms including, as appropriate, performance monitoring results, daily operating logs, laboratory records, records for operating costs, mechanism for reporting emergencies, and personnel and maintenance records.

6.0 Remedial Action

The Settling Defendants shall conduct Remedial Action activities in accordance with the RA Work Plan. Upon approval of the Final Design and the Construction Quality Assurance Plan, the Settling Defendants shall begin construction in accordance with the approved schedule. Significant field changes to the Remedial Action as set forth in the RA Work Plan and Final Design shall not be undertaken without the approval of EPA. All work on the Remedial Action shall be documented in enough detail to produce as-built construction drawings after the Remedial Action is complete. Review and/or approval of submittals documenting significant changes to the Remedial Action does not guarantee that the remedial action, when constructed, will meet the Performance Standards.

Unless otherwise directed by EPA, Settling Defendants shall not commence physical RA activities at the NHOU prior to approval of the RA Work Plan.

6.1 Construction Contractor

Settling Defendants shall notify EPA of the selected construction contractor no later than 45 days after EPA approval of the Final Design, or 45 days after EPA approval of the Intermediate Design if Settling Defendants choose to perform design/build. As evidence of contractor's qualifications, a QMP shall also be submitted, as defined in section 2.1 above.

6.2 Develop RA Work Plan

Within 90 days after the approval of the intermediate design submission, Settling Defendants shall submit to EPA and the State a work plan for the performance of the Remedial Action at the NHOU. The RA Work Plan shall follow the format described in Section 2.1.1 above, except with respect to the Description of Deliverables, which is described below.

The RA Work Plan shall include plans and schedules for: (1) the completion of the Remedial Action including a schedule for physical construction of the remedy as approved pursuant to Paragraph 10 of the CD; (2) selection of the construction contractor; (3) development and submittal of other required Remedial Action plans; (4) development and submittal of a revised Groundwater Monitoring Plan; (5) field investigation (if any); (6) methods for satisfying permitting requirements; (7) implementation of the Pre- and Post-Achievement O&M Plans; (8) formulation of the

Remedial Action team; (9) methodology for implementation of the Construction Quality Assurance Plan; (10) procedures and plans for the decontamination of equipment and the disposal of contaminated materials; and (11) procurement and contracting details.

The RA Work Plan shall also include plans for the completion of the following deliverables (described in more detail in section 6.3 below):

1. Site Management Plan (“SMP”);
2. Update Health and Safety Plan/Contingency Plan, including a Construction Safety Plan;
3. Construction Quality Assurance Plan (“CQA Plan”);
4. Revised Groundwater Management Plan;
5. Treatment System Performance Evaluation Test Plan; and,
6. Post-Achievement O&M Plan (see Section 5.6 above for a description).

6.2.1 Preconstruction Meetings

At least one preconstruction meeting shall be held after selection of the construction contractor but before initiation of construction. The meeting(s) shall include the Settling Defendants’ representatives and interested federal, state and local government agency personnel, and shall: define the roles, relationships, and responsibilities of all parties; review work area security and safety protocols; review any access issues; review the construction schedule; and review construction quality assurance procedures. The Settling Defendants shall ensure that the results of the preconstruction meeting(s) are documented and transmitted to all parties in attendance, including the names of people in attendance, issues discussed, clarifications made, and instructions issued.

6.3 Develop Site-Specific RA Plans

The Settling Defendants shall prepare and submit for EPA approval the other site-specific RA plans specified in this SOW, in accordance with the approved RA Work Plan. The following describes the site-specific RA plans that are required. The RA plans can be submitted in any format proposed by the Settling Defendants and approved by EPA.

6.3.1 Site Management Plan

The SMP shall describe how the Settling Defendants will manage the project to complete the work required at the site. The overall objective of the SMP is to provide the EPA with a written understanding and commitment by the Respondents of how various project aspects such as access, security, contingency procedures, management responsibilities, decontamination, waste disposal, budgeting, and data handling are to be managed during the RA. Specific objectives and provisions of the SMP shall include, but are not limited to, the following:

- Establishing the necessary procedures to obtain access for field activities and ensure that the EPA and the State are informed of access-related problems and issues.
- Preventing unauthorized entry to any construction areas.
- Establishing a field office location for on-site activities.
- Providing contingency and notification plans for potentially dangerous activities associated with the RA.
- Monitoring airborne contaminants released by site activities which may affect the local populations.
- Communicating to the EPA and the public the organization and management of the RA including key personnel and their responsibilities.

6.3.2 Updated Health and Safety Plan

A revised HASP must be submitted consistent with Section 2.2.1 of this SOW, which shall address the construction activities. EPA will review, but will neither approve nor disapprove, the HASP. Each of Settling Defendants' employees, and contractors, etc., is responsible for ensuring that its workers follow applicable federal and State worker health and safety regulations.

6.3.3 Construction Quality Assurance Plan

Settling Defendants shall submit for EPA's review a CQA Plan. The CQA Plan shall ensure, with a reasonable degree of certainty, that the completed RA meets or exceeds all design criteria, plans and specifications, and Performance Standards. The CQA Plan shall be prepared in accordance with Construction Quality Assurance for Hazardous Waste Land Disposal Facilities (EPA, 1986), and Quality Assurance and Quality Control for Waste Contaminated Facilities (EPA/600/R-93/182, 1993), as deemed appropriate by EPA. EPA will provide comments on the draft CQA Plan, but will neither approve nor disapprove the draft CQA Plan, consistent with Section X of the CD. The CQA Plan must be reviewed by EPA prior to the initiation of construction. The CQA Plan shall include the following elements:

- Responsibility of Key Personnel: Responsibility and authority of all organizations and key personnel involved in the remedial action construction (such as contractors and consultants).
- A list of the Settling Defendant's contractors and subcontractors and their roles.

- **CQA Personnel Qualifications:** The Settling Defendants shall establish the minimum qualifications of the CQA Officer and supporting inspection personnel. Settling Defendants shall provide (1) a description of the quality control organization, including a chart showing lines of authority; members of the Quality Assurance team, their responsibilities and qualifications; and, (2) acknowledgment that the QA team will implement the quality control system for all aspects of the work specified. Members of the QA team shall have previous experience in the type of QA/QC activities to be implemented and demonstrated capability to perform the required activities. They shall also be independent of the construction contractor.
- **Inspection Activities:** The Settling Defendants shall establish the observations and tests that will be required to monitor the construction and/or installation of the components of the RA. The CQA Plan shall include the scope and frequency of each type of inspection to be conducted. Inspections shall be required to verify compliance with environmental requirements and include, but not be limited to, air quality and emissions monitoring records, and waste disposal records (e.g., Resource Conservation and Recovery Act of 1976 transportation manifests). Inspections shall also ensure compliance with all health and safety procedures.
- **Sampling Requirements:** The Settling Defendants shall develop protocols for sampling activities, sample size, sample locations, frequency of testing, criteria for acceptance or rejection of samples, and plans for correcting problems as addressed in the project specifications. A description of the observations, inspections, and control testing that will be used to assure quality workmanship, verify compliance with the plans and specifications, or meet other quality control objectives during implementation of the Remedial Action shall be included. The CQA Plan shall specify laboratories to be used and include information certifying that personnel and laboratories performing the tests are qualified and that the equipment and procedures to be used comply with applicable standards.
- **Waste Disposal:** The Settling Defendants shall provide for the proper disposal of materials used and wastes generated during the RA (e.g., drill cuttings, contaminated soil, extracted groundwater, protective clothing, and disposable equipment). These provisions shall be consistent with the off-site disposal requirements of the Superfund Amendments and Reauthorization Act, the Resource Conservation and Recovery Act, and applicable state laws. The Settling Defendants, their authorized representative, or another party acceptable to the EPA shall be identified as the generator of wastes for the purpose of regulatory or policy compliance.

- **Documentation:** The Settling Defendants shall describe the reporting protocols for CQA activities. This shall include such items as daily summary reports, inspection data sheets, problem identification and corrective measures reports, construction photographs, design acceptance reports, and final documentation. Provisions for the final storage of all records shall be presented in the CQA Plan. The QA official shall report simultaneously to the Settling Defendants' representative and to EPA.
- **Definable Features of Work:** A definable feature of work is a task that is separate and distinct from other tasks and has separate quality control requirements. Settling Defendants shall develop a list of all definable features of work, which shall be presented and discussed in the CQA Plan.

6.3.4 Revised Groundwater Monitoring Plan

The Groundwater Monitoring Plan shall be revised to reflect the requirements of the start up and shake down period, as well as the long-term monitoring to be conducted Post-Achievement. The revised plan shall be submitted in accordance with Attachment 2 to the SOW.

6.3.5 Treatment System Performance Evaluation Test Plan

Settling Defendants shall prepare a detailed performance evaluation test plan that addresses all the key components of the treatment system. The intent of the plan is to confirm that all major equipment meets design or performance criteria (e.g., VOC emissions from treatment system meets air emissions limits, pumping rates, etc.). The Performance Evaluation Test Plan shall incorporate expected CDPH testing requirements for use of treated water as a drinking water source.

6.4 Remedial Action Construction and Notification of Construction Completion

Within thirty (30) days after EPA approval of the construction schedule, the Settling Defendants shall begin implementation of the Remedial Action as detailed in the approved RA Work Plan. Construction shall be completed within 180 days of EPA approval of the construction schedule. Settling Defendants shall submit a Notification of Construction Completion for EPA approval within five (5) days of completion of construction activities.

6.5 Start Up and Shakedown

The Settling Defendants shall have up to sixty (60) days for the Start Up and Shakedown Period, for the construction contractor to make minor adjustments as necessary to ensure the remedy is operating as designed. The Start Up and Shakedown period shall commence upon EPA approval of the Notification of Construction Completion.

6.6 Treatment System Performance Test and Report

Following EPA's approval of the Notification of Construction Completion and at least 14 days prior to the Pre-certification Inspection required by Section 6.7 of this SOW and Paragraph 44.a of the CD, the Settling Defendants shall conduct a treatment system performance test. The results of the test shall be provided in a

Treatment System Performance Test Report to be submitted to EPA prior to the Precertification Inspection.

6.7 Pre-certification Inspection

Within 90 days after EPA approval of the Notification of Construction Completion, the Settling Defendants shall notify EPA for the purposes of conducting a Precertification Inspection to be attended by EPA and the Settling Defendants. The Precertification Inspection shall be conducted within 10 days of the notice. Other participants may include federal, state, and local agencies with a jurisdictional interest. The inspection will confirm that the physical system is working as intended and the discharge criteria are being met.

If any construction deficiencies are discovered during the inspection, an Inspection Report noting the deficiencies shall be prepared. Re-testing shall be completed where deficiencies are revealed.

6.8 RA Completion Report

Within 60 days after the final Precertification Inspection, the Settling Defendants shall submit a written report demonstrating that the Remedial Action satisfies the requirements of the CD ("RA Completion Report"). In the report, a registered Professional Engineer and the Settling Defendants' Project Coordinator shall certify that the Remedial Action is operating and functioning as intended, and that the Performance Standards are being met. The RA Completion Report shall provide: a summary of the findings of the final Precertification Inspection; the results of operational and performance monitoring completed to date; and documentation to substantiate the Settling Defendants' certification of full satisfaction with Sections XIII of the CD, including, but not limited to, relevant data presented in the reports and deliverables outlined in this SOW. The RA Completion Report shall contain the following statement, signed by a responsible corporate official of the Settling Defendants or the Settling Defendants' Project Coordinator:

"I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations."

The RA Completion Report shall include an electronic copy of the as-built drawings on a CD or DVD as well as 11- x 17-inch-size hard copies.

In addition, the RA Completion Report shall also include the following information:

1. Demonstration of Cleanup Activity QA/QC: Document that the construction quality assurance / quality control plan was implemented and that construction

completion is consistent with the ROD and remedial design plans and specifications.

2. Activities And Schedule For Site Completion

- a. Identify activities remaining in order to:
 - i. Assure effectiveness of the remedy (e.g., institutional controls, etc.);
 - ii. Assure consistency with the National Contingency Plan (e.g., joint EPA / State inspection, Post-Achievement determination);
 - iii. Satisfy requirements for site completion (e.g., Final RA Report).
- b. Specify the organization responsible for implementation of each activity.

6.9 Long-Term Operation and Maintenance

The Settling Defendants shall submit an updated Draft Post-Achievement O&M Plan to incorporate manufacturer/vendor information and any design modifications implemented during the construction phase of the Remedial Action in accordance with Attachment 2. The approved plan will be referred to as the Final Post-Achievement O&M Plan. The plan shall include all necessary operation and maintenance information for the operating personnel, and be consistent with section 5.6 above.

O&M shall be performed in accordance with the approved Post-Achievement O&M Plan until EPA determines, pursuant to Paragraph 12 of the CD, that the Work is complete.

6.10 Quarterly Performance Evaluation Reports

The Settling Defendants shall prepare and submit Quarterly Performance Evaluation Reports that will document all Work performed by Settling Defendants during the previous quarter, including the groundwater extraction and treatment system performance, and shall include an evaluation of compliance with the Performance Standards as set forth in the ROD. In addition, these reports shall include information such as, but not limited to, the quarterly groundwater extraction rates, cumulative contaminant mass removed, system operational times, and description of general site conditions.

6.11 Noncompliance Actions

If at any time during the operation of the system a malfunction or performance issue arises, Settling Defendants shall promptly notify EPA. A noncompliance notification shall be sent to EPA no later than seven (7) days after Settling Defendants' receipt of information indicating noncompliance, or potential noncompliance, with the Performance Standards set forth in the ROD and/or the RA Work Plan.

6.11.1 Draft Compliance Action Plan

The Settling Defendants shall prepare and submit a Draft Compliance Action Plan 14 days after receipt of information indicating noncompliance, or potential noncompliance, with the Performance Standards. This plan will describe and present a schedule for actions that the Settling Defendants will take to re-establish compliance with the Performance Standards set forth in the ROD, including a schedule for submittal of a Compliance Correction Report.

Upon EPA approval, Settling Defendants shall implement the Compliance Action Plan.

6.11.2 Compliance Correction Report

The Settling Defendants shall submit a Compliance Correction Report following the action(s) taken pursuant to Section 6.11.1 above, which details the actions taken to address the problem(s) and the results of the actions. The report shall be submitted in accordance with the schedule established in the approved Compliance Action Plan.

7.0 Institutional Control Implementation and Assurance Plan

An ICIAP will be developed by EPA, the Settling Defendants, and LADWP within 30 days of the Effective Date of the CD. The ICIAP shall document in detail the actions to be taken to implement the institutional controls and the parties responsible for each action throughout the course of the Work. The principle institutional control for the NHOU is the Groundwater Management Plan specified in the Second Interim ROD. The ICIAP shall be based on the preliminary evaluation of institutional controls performed under the FFS, and shall include: (a) the list of entities (including State and local agencies, and other parties) responsible for the implementation; and, (b) written agreements with the parties responsible for the implementation, monitoring, and enforcement of the institutional control. Upon EPA's approval, the ICIAP will become enforceable under the CD.

Attachment 1: Site Map

Attachment 2: Summary of Deliverables

Ref SOW Section	Ref CD Section	Deliverable	No. of copies ¹	Due ²	EPA Estimated Review period ³
2.1	VI	Selection and QMP of Supervising Contractor and Sustainability Manager	Email	Within 10 days of lodging of the CD	7 days
7.0		Institutional Controls Implementation and Assurance Plan		30 days after Effective Date	21 days
Communications					
2.3.1		Project Status Updates	email to EPA and DTSC	Weekly, or as approved in Work Plans	N/A
2.3.2		Monthly Progress Reports	Electronic via email	10 th day of each month	14 days
2.3.3		Progress Meeting Notes	Email	Within 5 days of each meeting	N/A
2.3.4		Annual Performance Evaluation Report		Annually, by September 30th	21 days
Design and Action					
5.1		Draft RD Work Plan		30 days after EPA's approval of the Supervising Contractor	30 days
5.2		Final RD Work Plan		15 days after receipt of any EPA comments on the draft RD Work Plan	10 days
2.2.1		Health And Safety Plan/Contingency Plan	electronic	As approved in RD Work Plan	21 days
2.2.2		Sampling & Analysis Plan		As approved in RD Work Plan	30 days
2.2.2		Analytical Data	electronic	See section 2.2.2 (QAPP bullet)	
2.2.3		Groundwater Monitoring Plan		30 days after approval of the RD Work Plan	21 days
2.2.4		Remedial Design Quality Assurance Project Plan		as approved in RD Work Plan	21 days
4.5.3		Data Evaluation Report		90 days after completion of each monitoring event	21 days
5.3		Preliminary Design		90 days after EPA approval of the RD Work Plan	30 days
5.4		Intermediate Design		90 days after EPA approval of the Preliminary Design	30 days

Ref SOW Section	Ref CD Section	Deliverable	No. of copies ¹	Due ²	EPA Estimated Review period ³
5.5		Prefinal Design		90 days after EPA approval of the Intermediate Design	30 days
5.6		Draft Pre-Achievement O&M Plan		With the Prefinal Design	30 days
5.5		Final Design		30 days after EPA approves the Prefinal Design	30 days
5.6		Final Draft Pre-Achievement O&M Plan		15 days after EPA comments on the draft Plan	21 days
Remedial Action					
6.1		Notification and QMP of Selected construction contractor	email	45 days after approval of Final Design, or the Intermediate Design, if a design/build approach is employed	21 days
6.2		Remedial Action Work Plan		90 days after submittal of Intermediate Design	30 days
6.2		Detailed Construction Schedule		With the RA Work Plan	21 days
6.3.1		Site Management Plan	Electronic	30 days after approval of RA Work Plan	21 days
6.3.2		Updated Health and Safety Plan	Electronic	30 days after notification of Selected construction contractor	21 days
6.3.3		Construction QA Plan	Electronic	50 days after Preliminary Design approval	21 days
6.3.4		Revised GW Monitoring Plan		As approved in the RA Work Plan	21 days
6.3.5		Treatment System Performance Evaluation Test Plan		As approved in RA Work Plan	21 days
6.2.1		Pre-construction Meetings	Email notice	After notice of selection of construction contractor, and before initiation of construction	21 days
6.4		Begin RA Implementation	Email notice	Within 30 days of EPA approval of Construction Schedule	
Post - Construction					
6.4		Notification of Construction Completion	email	Within 185 days of EPA approval of Construction Schedule	5 days
6.5		Start up and Shake Down Period	Email notice	60 day period, commencing upon EPA approval of Notification of Construction Completion	

Ref SOW Section	Ref CD Section	Deliverable	No. of copies ¹	Due ²	EPA Estimated Review period ³
6.6		Treatment System Performance Test and Report		14 days before Pre-certification Inspection	7 days
6.7		Notification of Precertification Inspection	email	90 days after EPA approval of Notification of Construction Completion	
6.7		Precertification Inspection	Email notice	Within 10 days of Notification of Precertification Inspection	
6.8		RA Completion Report		60 days after the final Precertification Inspection	
6.9		Final Draft Post-Achievement O&M Plan		30 days prior to Precertification Inspection	30 days
6.10		Quarterly Performance Evaluation Reports		Quarterly; commencing with the Final Certification Inspection	21 days
6.11		Noncompliance Notification	email	7 days after receipt of information indicating noncompliance, or potential noncompliance	
6.11.1		Draft Compliance Action Plan	email	14 days after receipt of information indicating noncompliance, or potential noncompliance	7 days
6.11.2		Compliance Correction Report	email	As established in approved Compliance Action Plan	21 days

¹ Unless otherwise indicated, four (4) hard copies shall be provided: one (1) copy sent to USEPA, one (1) copy sent to EPA's contractor, one (1) copy sent to LADWP, and one (1) copy sent to DTSC. Four (4) electronic copies (on compact disc) also shall be provided - one (1) copy to EPA, one (1) copy to EPA's contractor, one (1) copy sent to LADWP, and one (1) copy to DTSC.

² All deliverables set forth in Attachment 2 will be reviewed and approved by EPA in accordance with Section XI of the CD. If EPA disapproves a deliverable and requests modifications pursuant to Section XI of the Consent Decree, the Settling Defendants shall revise the deliverable and resubmit it to EPA within the timeframe specified in Section XI of the CD.

³ The "EPA Estimated Review Period" specified herein is set by EPA as a goal. EPA will strive to achieve this goal to keep the project on schedule. However, if EPA is unable to meet one or more of these review periods, and deliverables from the Settling Defendants are affected by EPA's delay, the deadlines for those deliverables will reflect such delay.

Attachment 3: Primary Guidance and Resources

The following list, although not comprehensive, consists of many of the regulations and guidance documents that apply to the RD/RA process:

- 1) *Greener Cleanups Policy - EPA REGION 9*, issued September 14, 2009; found at: <http://www.epa.gov/region09/climatechange/green-sites.html>.
- 2) *Superfund Green Remediation Strategy*, draft dated August 2009, <http://www.epa.gov/superfund/greenremediation/sf-gr-strategy.pdf>.
- 3) *CERCLA Compliance with Other Laws Plan*, Two Volumes, U.S. EPA, Office of Emergency and Remedial Response, August 1988 (DRAFT), OSWER Directive No. 9234.1-01 and -02.
- 4) *Superfund Community Involvement Handbook*, U.S. EPA, Office of Solid Waste and Emergency Response, April 2005, EPA-540-K-05-003.
- 5) *EPA Guidance on Systematic Planning Using the Data Quality Objectives Process* (EPA QA/G-4, 2006).
- 6) Federal Acquisition Regulation, Washington, DC: U.S. Government Printing Office (revised periodically).
- 7) *Guidance on Expediting Remedial Design and Remedial Actions*, EPA/540/G-90/006, August 1990.
- 8) *Guidance on Remedial Actions for Contaminated Ground Water at Superfund Sites*, U.S. EPA Office of Emergency and Remedial Response (DRAFT), OSWER Directive No. 9283.1-2.
- 9) *Guide to Management of Investigation-Derived Wastes*, U.S. EPA, Office of Solid Waste and Emergency Response, Publication 9345.3-03FS, January 1992.
- 10) *Interim Guidance on Compliance with Applicable of Relevant and Appropriate Requirements*, U.S. EPA, Office of Emergency and Remedial Response, July 9, 1987, OSWER Directive No. 9234.0-05.
- 11) *Institutional Controls: A Guide to Implementing, Monitoring and Enforcing Institutional Controls at Superfund, Brownfields, Federal Facility, UST and RCRA Corrective Action Cleanups*, (Draft), February 2003, OSWER 9355.0-89, EPA 540-R-04-002, <http://www.epa.gov/superfund/action/ic/guide/index.htm>
- 12) National Oil and Hazardous Substances Pollution Contingency Plan; Final Rule, Federal Register 40 CFR Part 300, March 8, 1990.
- 13) *Permits and Permit Equivalency Processes for CERCLA On-Site Response Actions*, February 19, 1992, OSWER Directive 9355.7-03.
- 14) *Quality in the Constructed Project: A Guideline for Owners, Designers and Constructors, Volume I, Preliminary Edition for Trial Use and Comment*, American Society of Civil Engineers, May 1988.
- 15) *Remedial Design/Remedial Action (RD/RA) Handbook*, U.S. EPA, Office of Solid Waste and Emergency Response (OSWER), 9355.0-04B, EPA 540/R-95/059, June 1995.

- 16) *EPA Requirements for Quality Assurance Project Plans for Environmental Data Operations*, U.S. EPA, EPA/240/B-01/003, March 2001, Reissued May 2006.
- 17) *Scoping the Remedial Design* (Fact Sheet), February 1995, OSWER Publ. 9355-5-21 FS.
- 18) Standards for the Construction Industry, Code of Federal Regulations, Title 29, Part 1926, Occupational Health and Safety Administration.
- 19) Standards for General Industry, Code of Federal Regulations, Title 29, Part 1910, Occupational Health and Safety Administration.
- 20) *Superfund Guidance on EPA Oversight of Remedial Designs and Remedial Actions Performed by Potentially Responsible Parties*, April 1990, EPA/540/G-90/001.
- 21) *Value Engineering* (Fact Sheet), U.S. EPA, Office of Solid Waste and Emergency Response, Publication 9355.5-03FS, May 1990.
- 22) *USEPA Contract Laboratory Program National Functional Guidelines for Low Concentration Organic Data Review*, EPA-540-R-00-006, June 2001.
- 23) *USEPA Contract Laboratory Program National Functional Guidelines for Superfund Organic Methods Data Review*, EPA-540-R-08-01, June 2008.
- 24) *Policy Guidance for Direct Domestic Use of Extremely Impaired Sources*, CDPH Policy Memorandum 97-005
- 25) *Focused Feasibility Study, North Hollywood Operable Unit, San Fernando Valley Area 1 Superfund Site*, EPA, prepared by CH2MHILL, July 2009
- 26) *American National Standards Practices for Respiratory Protection*. American National Standards Institute Z88.2-1980, March 11, 1981.
- 27) *A Compendium of Superfund Field Operations Methods*, Two Volumes, USEPA, Office of Emergency and Remedial Response, EPA/540/P-87/001a, August 1987, OSWER Directive No. 9355.0-14.
- 28) *Data Quality Objectives for Remedial Response Activities*, USEPA, Office of Emergency and Remedial Response and Office of Waste Programs Enforcement, EPA/540/G-87/003, March 1987, OSWER Directive No. 9335.0-7B.
- 29) *Engineering Support Branch Standard Operating Procedures and Quality Assurance Plan*, USEPA Region IV, Environmental Services Division, April 1, 1986 (revised periodically).
- 30) *NIOSH Plan of Analytical Methods*, 2nd edition. Volumes I-VII for the 3rd edition, Volumes I and II, National Institute of Occupational Safety and Health.
- 31) *Occupational Safety and Health Guidance Plan for Hazardous Waste Site Activities*, National Institute of Occupational Safety and Health/Occupational Health and Safety Administration/United States Coast Guard/Environmental Protection Agency, October 1985.
- 32) *Superfund Remedial Design and Remedial Action Guidance*, USEPA, Office of Emergency and Remedial Response, June 1986, OSWER Directive No. 9355.0-4A.

- 33) *EPA Region IX Sampling and Analysis Plan Guidance and Template* (R9QA/002.1, April, 2000).
- 34) *Draft: Region 9 Superfund Data Evaluation/Validation Guidance*, USEPA, Quality Assurance Office, R9QA/006.1, December 2001.
- 35) *Methods for Monitoring Pump and Treat Performance*, USEPA, Office of Research and Development, June 1994 (EPA 600/R-94/123).
- 36) *A Systematic Approach for Evaluation of Capture Zones at Pump and Treat Systems*, EPA, January 2008 (EPA/600/R-08/003).
- 37) *Operation and Maintenance in the Superfund Program*, EPA, May 2001, (OSWER 9200.1-37FS, EPA 540-F-01-004).
- 38) *Specifications and Guidelines for Quality Systems for Environmental Data Collection and Environmental Technology Programs* (American National Standard, January 5, 1995), ANSI/ASQC E4-1994.
- 39) *EPA Requirements for Quality Management Plans (QA/R-2)*, EPA/240/B-01/002, March 2001, reissued May 2006.
- 40) *EPA Guidance for Data Quality Assessment, Practical Methods for Data Analysis* (EPA QA/G-9, 1998).

Attachment 4: Performance Standards for COCs

**Table 6. Performance Standards for COCs in Extracted and Treated Groundwater
(from ROD)**

Contaminant of Concern	Federal MCL (µg/L)	California MCL (µg/L)	CDPH Notification Level (µg/L)	Basis for Performance Standard	Performance Standard (µg/L) ^a
TCE	5	5	None	Federal MCL	5
PCE	5	5	None	Federal MCL	5
1,1-DCA	5	5	None	Federal MCL	5
1,2-DCA	0.5	0.5	None	Federal MCL	0.5
1,1-DCE	6	6	None	Federal MCL	6
cis-1,2-DCE	6	6	None	Federal MCL	6
1,1,2-TCA	5	5	None	Federal MCL	5
Carbon tetrachloride	0.5	0.5	None	Federal MCL	0.5
Methylene Chloride	5	5	None	Federal MCL	5
Total Chromium	100	50	None	California MCL	50
Hexavalent Chromium	None ^b	None ^{b,c}	None	See footnote "d"	5 ^d
Perchlorate	None	6	None	California MCL	6
TCP	None	None	0.005	CDPH notification level	0.005
1,4-dioxane	None	None	3	CDPH notification level	3
NDMA	None	None	0.01	CDPH notification level	0.01

Notes:

^aThe CDPH permitting process may require lower concentrations in the treated effluent.

^bFederal and state MCLs specific to hexavalent chromium have not been established; therefore, the state MCL for total chromium currently is applied to hexavalent chromium.

^cA PHG for hexavalent chromium is currently under development by OEHHA. Following development of a PHG, a state MCL specific to hexavalent chromium may be established.

^dBased on discussions with LADWP, it is EPA's understanding that LADWP will continue to use a voluntary cleanup level of 5 µg/L for hexavalent chromium for water it will accept for use in its water supply system. Consequently, under the drinking water end use option, chromium treatment at the NHOU will be needed so that LADWP's voluntary cleanup level of 5 µg/L can be met.

SFV NHOU
Contact Information for Special Notice Mailing
May 18, 2010

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Aircraft Service International, Inc.	Keith P. Ryan, President and CEO Aircraft Service International, Inc. 201 S. Orange Avenue, Suite 1100A Orlando, FL 32801 (407) 648-7373	Patricia Nance Annunziato Senior Legal Counsel BBA Aviation Shared Services, Inc. 201 S. Orange Avenue, Suite 1100A Orlando, FL 32801 (407) 206-8441	
Benz Disposal Co.	Frank Visco, President Benz Disposal Co. 12224 Montague Street Pacoima, CA 91331 Telephone: (818) 834-3311		
Burbank-Glendale-Pasadena Airport Authority	Dan Feger, Executive Director 2627 N. Hollywood Way Burbank, CA 91505 (818) 840-8840	Norman A. Dupont, Esq. Richards, Watson & Gershon 355 South Grand Avenue 40th Floor Los Angeles, CA 90071 (213) 253-0235 email: ndupont@rwglaw.com	
California Car Hikers Service	Nathan B. Adlen, President California Car Hikers Service 11590 Tuxford Street Sun Valley, CA 91352 Telephone: (818) 504-1091	Richard E. Williamson, Attorney Ezer & Williamson LLP 21515 Hawthorne Blvd. Suite 1150 Torrance, CA 90503 (310) 347-4606	
CalMat Co.	A.D. Wessel, President CalMat Co. 3200 San Fernando Rd. Los Angeles, CA 90065 (323) 258-2777	Kenneth A. Ehrlich Jeffer Mangels Butler & Marmaro LLP 1900 Avenue of the Stars, 7th Floor Los Angeles, CA 90067 (310) 203-8080 (main) (310) 785-5395 (direct) e-mail: Kehrlich@jmbm.com	

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Hayward Associates, LLC	Glenn C. McElroy, Co-Trustee, Glenn C. McElroy Family Trust dated 10/14/1992, Managing Member Hayward Associates, LLC 16670 Coral Cay Lane Huntington Beach, CA 92649	Dongell Lawrence Finney LLP 707 Wilshire Blvd., 45th Floor Los Angeles, CA 90017 (213) 943-6100	
Home Depot U.S.A., Inc.	Francis S. Blake, Chairman and CEO 2455 Paces Ferry Road N.W. Atlanta, GA 30339 Telephone: (770) 433-8211	Fay Howard Home Depot, Office of General Counsel 2455 Paces Ferry Road N.W. Atlanta, GA 30339 (770) 384-3363	
Honeywell International Inc.	David M. Cote, Chairman and CEO 101 Columbia Rd. Morristown, NJ 07962 (973) 455-2000	Sean Morris Arnold & Porter LLP 777 S. Figueroa St., 44th Floor Los Angeles, CA 90017-5844 (213) 243-4222 e-mail: Sean_Morris@aporter.com Gene A. Lucero Latham & Watkins LLP 355 South Grand Avenue Los Angeles, CA 90071-1560 (213) 891-8332 email: gene.lucero@lw.com	Mr. Benny DeHghi, Manager Remediation and Evaluation Services Honeywell International Inc. M/S 23-21-80 2525 West 190th Street Torrance, CA 90505 (310) 512-2296

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Lockheed Martin Corporation	Robert J. Stevens, Chairman and CEO Lockheed Martin Corporation 6801 Rockledge Dr. Bethesda, MD 20817-1877 (301) 897-6000	Alan N. Bick, Esq. Gibson, Dunn & Crutcher LLP 3161 Michelson Drive Irvine, CA 92612-4412 (949) 451-4211 C. Douglas Goins, Assistant General Counsel Lockheed Martin Corporation 6801 Rockledge Dr. Bethesda, MD 20817-1877 (301) 214-3402	Carolyn S. Monteith Remediation Project Lead Lockheed Martin Corporation 2950 N. Hollywood Way, Suite 125 Burbank, CA 91505 Office: (504) 254.2471 Cell: (818) 303-5252
Los Angeles By-Products Co.	Robert M. McAllister, President 10940 Portal Drive Los Alamitos, CA 90720 (714) 828-3090	Lawrence Meyer Greenwald, Hoffman, Meyer & Montes, LLP 500 North Brand Blvd. Suite 920 Glendale, CA 91203-1923 (818) 507-8100	

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NC II Family Limited Partnership	Erasmus C. & Nora C. Dominguez, General Partners 26505 Josel Drive Santa Clarita, CA 91387	G. Marshall Hann, Attorney 25350 Magic Mountain Parkway, Ste. 130 Valencia, CA 91355 (661) 255-3600	
Pacific Magnetic and Penetrant Co., Inc.	Erik Andersen, President 6829 Farmdale Ave. North Hollywood, CA 91605 (818) 765-7266		
Pacwest Properties, LLC	Erik Bruun-Andersen, Member/Manager 6829 Farmdale Avenue North Hollywood, CA 91605 (818) 765-7266		
Pick-Your-Part Auto Wrecking	Joseph M. Holsten, President 120 N. LaSalle St., Suite 3300 Chicago, Illinois 60602-2146 (312) 621-1950	Michael Gallagher Dongell Lawrence Finney LLP 707 Wilshire Blvd., 45th Floor Los Angeles, CA 90017 Telephone: (213) 943-6112	
Public Storage	Ronald L. Havner, Jr., President and CEO 701 Western Avenue Glendale, CA 91201 (818) 244-8080	Christopher E. Tucker, Vice President & Real Estate Counsel Public Storage 701 Western Ave. Glendale, CA 91201 (818) 244-8080	

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May 18, 2010

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The Basinger Trusts: Basinger B Trust (Exemption Trust) and Basinger C Trust (Marital Trust)	Viola M. Basinger, Trustee, The Basinger Trusts, c/o Ms. Joanne Gillmore [address redacted for privacy]	Patricia O'Toole, Attorney The O'Toole Law Firm 333 South Grand Ave. 42nd Floor Los Angeles, CA 90071 Telephone: (213) 630-4200	
The Wagner Living Trust	Linda Wagner Lipscomb, Trustee [address redacted for privacy]	Patricia O'Toole, Attorney The O'Toole Law Firm 333 South Grand Ave. 42nd Floor Los Angeles, CA 90071 Telephone: (213) 630-4200	
Waste Management Recycling and Disposal Services of California, Inc.	Duane C. Woods, President 1001 Fannin Street, Suite 4000 Houston, TX 77002 Telephone: (713) 512-6200	Steve Morgan Vice President and Assistant General Counsel Waste Management 1001 Fannin, Suite 4000 Houston, TX 77002 Andrew Kenefick Senior Legal Counsel Western Group Legal Department Waste Management 801 2nd Avenue, Suite 614 Seattle, WA 98104	



Office of Enforcement and Compliance Assurance **INFORMATION SHEET**

U. S. EPA Small Business Resources

If you own a small business, the United States Environmental Protection Agency (EPA) offers a variety of compliance assistance resources such as workshops, training sessions, hotlines, websites, and guides to assist you in complying with federal and state environmental laws. These resources can help you understand your environmental obligations, improve compliance, and find cost-effective ways to comply through the use of pollution prevention and other innovative technologies.

Compliance Assistance Centers

(www.assistancecenters.net)

In partnership with industry, universities, and other federal and state agencies, EPA has established Compliance Assistance Centers that provide information targeted to industries with many small businesses.

Agriculture

(www.epa.gov/agriculture or 1-888-663-2155)

Automotive Recycling Industry

(www.ecarcenter.org)

Automotive Service and Repair

(www.ccar-greenlink.org or 1-888-GRN-LINK)

Chemical Industry

(www.chemalliance.org)

Construction Industry

(www.cicacenter.org or 1-734-995-4911)

Education

(www.campuserc.org)

Healthcare Industry

(www.hercenter.org or 1-734-995-4911)

Metal Finishing

(www.nmfrc.org or 1-734-995-4911)

Paints and Coatings

(www.paintcenter.org or 1-734-995-4911)

Printed Wiring Board Manufacturing

(www.pwbrc.org or 1-734-995-4911)

Printing

(www.pneac.org or 1-888-USPNEAC)

Transportation Industry

(www.transource.org)

Tribal Governments and Indian Country

(www.epa.gov/tribal/compliance or 202--564-2516)

US Border Environmental Issues

(www.bordercenter.org or 1-734-995-4911)

The Centers also provide State Resource Locators (www.envcap.org/statetools/index.cfm) for a wide range of topics to help you find important environmental compliance information specific to your state.

EPA Websites

EPA has several Internet sites that provide useful compliance assistance information and materials for small businesses. If you don't have access to the Internet at your business, many public libraries provide access to the Internet at minimal or no cost.

EPA's Home Page

www.epa.gov

Small Business Gateway

www.epa.gov/smallbusiness

Compliance Assistance Home Page

www.epa.gov/compliance/assistance

Office of Enforcement and Compliance Assurance

www.epa.gov/compliance

Voluntary Partnership Programs

www.epa.gov/partners



U.S. EPA SMALL BUSINESS RESOURCES

Hotlines, Helplines & Clearinghouses

(www.epa.gov/epahome/hotline.htm)

EPA sponsors many free hotlines and clearinghouses that provide convenient assistance regarding environmental requirements. A few examples are listed below:

Clean Air Technology Center

(www.epa.gov/ttn/catc or 1-919-541-0800)

Emergency Planning and Community Right-To-Know Act

(www.epa.gov/superfund/resources/infocenter/epcra.htm or 1-800-424-9346)

EPA's Small Business Ombudsman Hotline provides regulatory and technical assistance information.
(www.epa.gov/sbo or 1-800-368-5888)

The National Environmental Compliance Assistance Clearinghouse provides quick access to compliance assistance tools, contacts, and planned activities from the U.S. EPA, states, and other compliance assistance providers
(www.epa.gov/clearinghouse)

National Response Center to report oil and hazardous substance spills.
(www.nrc.uscg.mil or 1-800-424-8802)

Pollution Prevention Information Clearinghouse
(www.epa.gov/opptintr/ppic or 1-202-566-0799)

Safe Drinking Water Hotline
(www.epa.gov/safewater/hotline/index.html or 1-800-426-4791)

Stratospheric Ozone Refrigerants Information
(www.epa.gov/ozone or 1-800-296-1996)

Toxics Assistance Information Service also includes asbestos inquiries.
(1-202-554-1404)

Wetlands Helpline
(www.epa.gov/owow/wetlands/wetline.html or 1-800-832-7828)

State Agencies

Many state agencies have established compliance assistance programs that provide on-site and other types of assistance. Contact your local state environmental agency for more information or the following two resources:

EPA's Small Business Ombudsman
(www.epa.gov/sbo or 1-800-368-5888)

Small Business Environmental Homepage
(www.smallbiz-enviroweb.org or 1-724-452-4722)

Compliance Incentives

EPA provides incentives for environmental compliance. By participating in compliance assistance programs or voluntarily disclosing and promptly correcting violations before an enforcement action has been initiated,

businesses may be eligible for penalty waivers or reductions. EPA has two policies that potentially apply to small businesses:

The Small Business Compliance Policy

(www.epa.gov/compliance/incentives/smallbusiness)

Audit Policy

(www.epa.gov/compliance/incentives/auditing)

Commenting on Federal Enforcement Actions and Compliance Activities

The Small Business Regulatory Enforcement Fairness Act (SBREFA) established an SBA Ombudsman and 10 Regional Fairness Boards to receive comments from small businesses about federal agency enforcement actions. If you believe that you fall within the Small Business Administration's definition of a small business (based on your North American Industry Classification System (NAICS) designation, number of employees, or annual receipts, defined at 13 C.F.R. 121.201; in most cases, this means a business with 500 or fewer employees), and wish to comment on federal enforcement and compliance activities, call the SBREFA Ombudsman's toll-free number at 1-888-REG-FAIR (1-888-734-3247).

Every small business that is the subject of an enforcement or compliance action is entitled to comment on the Agency's actions without fear of retaliation. EPA employees are prohibited from using enforcement or any other means of retaliation against any member of the regulated community in response to comments made under SBREFA.

Your Duty to Comply

If you receive compliance assistance or submit comments to the SBREFA Ombudsman or Regional Fairness Boards, you still have the duty to comply with the law, including providing timely responses to EPA information requests, administrative or civil complaints, other enforcement actions or communications. The assistance information and comment processes do not give you any new rights or defenses in any enforcement action. These processes also do not affect EPA's obligation to protect public health or the environment under any of the environmental statutes it enforces, including the right to take emergency remedial or emergency response actions when appropriate. Those decisions will be based on the facts in each situation. The SBREFA Ombudsman and Fairness Boards do not participate in resolving EPA's enforcement actions. Also, remember that to preserve your rights, you need to comply with all rules governing the enforcement process.

EPA is disseminating this information to you without making a determination that your business or organization is a small business as defined by Section 222 of the Small Business Regulatory Enforcement Fairness Act or related provisions.